# Better Crops with PLANT FOOD

July 1927 10 Cents

The Pocket Book of Agriculture.

# Foreword

THIS is the second issue of BETTER CROPS WITH PLANT FOOD.

BETTER CROPS began publication in September, 1923, and PLANT FOOD came into print in January, 1926. The former was issued monthly and the latter every two months.

The mission of the two magazines has been virtually identical—to serve the agricultural leaders of the country, first, by publishing sound, dependable information on crops and fertilizers and, second, by acting as a forum through which authorities might exchange opinions and give others the benefit of their experience.

This similarity of aim, together with the fusion of the scientific and agricultural departments of the German and the French Potash interests, has made the combination of the two magazines advisable. It is hoped this will result in a more efficient service and a bigger and better publication.

BETTER CROPS WITH PLANT FOOD will strive to promote and maintain an interest in factors pertaining to a more profitable agriculture.

Sound agricultural research and experimental work is one of the most important of these factors. It will therefore be the policy of this magazine to actively support all groups and agencies doing such work and cooperate heartily with the agencies that carry the results to the farmer.

In working toward these objectives BETTER CROPS WITH PLANT FOOD will constantly strive to be interesting, attractive, and thoroughly dependable.

# Better Crops with PLANT FOOD

The Whole Truth—Not Selected Truth

R. H. STINCHFIELD, *Managing Editor* SID NOBLE, *Editor*
*Editorial Offices:* 19 West 44th Street, New York.

VOLUME IX NUMBER TWO

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Agricultural and Scientific Bureau
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*of Amsterdam, Holland*
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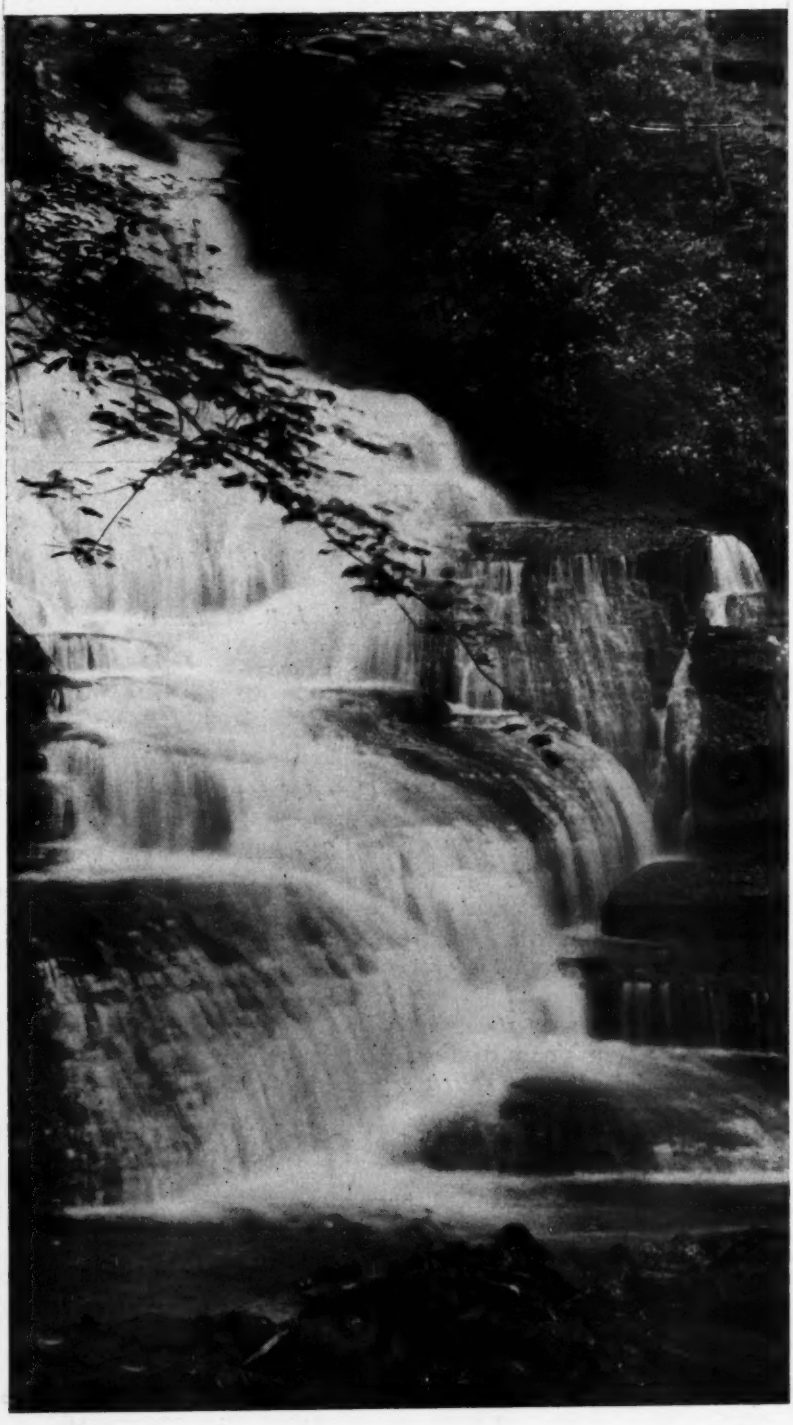

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VOL. IX NEW YORK, JULY, 1927 No. 2

# RECREATION

By Jeff McDermid

VACATION time is here for the non-agricultural two-thirds of America. Carking care is supposed to give way to corking content. The summer solstice ushers in the universal exodus!

As the world pays a big price for its recreation, it must be a subject worth pondering. Trite but true, before making an investment, we must investigate.

Recreation in its best sense means re-creation. The human engine goes to the garage of the great outdoors to have the carbon removed, the valves tightened and ground for another season of stress and strain.

In its worst aspects, it is "wreck-re-ation" —a violent effort to relax while the muscles are tense, which can't be done. Wreck-reation is the solace of feverish fools and the breeder of headaches, indigestion, broken limbs, and flat bank books. It is the enemy of genuine recreation in the sense that the upholders of the blue laws cannot see the difference between honest fun and dissipation. Therefore, the good dog is blamed for worrying the sheep,

## JEFFISMS

Recreation in its best sense means re-creation. In its worst aspects, it is "wreck-re-ation."

* * *

You can get benefit from a vacation spent in making play out of work, but not by making work out of play.

* * *

You might as well forget the nominal cost of a vacation, for you'll pay for it whether you take it or not.

* * *

Cashing out beats cashing in!

whereas the mongrel cur is the real culprit.

Recreation assumes various forms. It may be play, sport, change of avocation, or just doing nothing. Your doctor may prescribe the best form for you, but a stern banker friend and my Scotch ancestry decide it all for me.

You can get benefit from a vacation spent in making play out of work, but not by making work out of play. I have an illustration of this in mind.

A legal friend of mine sought a northern haven of supposed solitude in order to catch blue-gills, rock bass, wall-eyed pike, or whatever it was that the resorters used for allurement to the adventurous.

On the first day in the bosky retreat he met an unfortunate comrade of the World War, living on a cut-over land farm, whose wife was sick. Help was scarce, and this blueberry farmer had to build a barn to shelter his cows and chickens, as fresh milk and eggs meant longer life to the woman.

My friend forgot his fishing fever, rolled up his sleeves and grabbed hammer, saw, and axe. Together they toiled at the heavy job and cooked their own meals besides. Blisters, slivers, bruises, bumps, scrapes, and contusions were the body marks earned by my friend in addition to the "natural tan" mentioned in the circular. Nary a fish bite, but he said it was a snap just the same.

He made play out of work; they finished the shack and put a new roof on the dwelling besides; and the only thing he lost by it was a stock of fish stories he might have peddled in the court room afterwards.

Another less cosmopolitan friend, newly rich and bored to death, set out the same season for a hunting and fishing trip in the mountains. Loaded down like the *Compleat Angler*, fixed up with more of an arsenal than the Mexican Army, equipped with a steamer trunk full of club house summer duds, including golf and tennis kits and a box of the "best sells" to read—this misguided friend spent all his time in the inventory and baggage business.

Guides stole his guns and lost him in the woods, introduced him to poison ivy and chiggers, scattered his flossy raiment from Thunder Peak to Shindig Pass, gave him a ducking in a lake, a wild mule ride, and a dose of ptomaine. He got some patchy coats of tan for his money, and also a tanning from an irate lumber-jack. He finally emerged after three weeks of mosquitoes, miasma, and misery, looking like Rip Van Winkle and the Wandering Jew combined.

If that kind of play is a recess, then give me a job carrying water to the Mississippi!

SPORT is a word which has somewhat outgrown its ancient meanings. You know, it comes from the word disport—to divert, amuse, or deride, and mock. When it assumed its crudest forms in the days of Nero and the Caesars those who sat on the stone benches of the amphitheater had little of the true sporting instinct. They came to mock unhappy victims of conquest. They had none of the generous admiration that we have for a game loser. In other words, possessing no Babe Ruth, they were ruthless in more ways than one.

Down a few centuries later when Merrie England was busy at cock-fighting, bear-baiting, horse-racing, and the sport of hare and hounds, we see another meaning creeping into this form of recreation. Sport was then defined as "diversion of the field, as fowling, hunting, racing, games, and the like, *especially* when money is staked."

The element of hazard and the custom of wager ruined the future for sport in its chances for pioneering in America. The dour and straight-laced folk who landed on that bleak

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*Alabama negro agents and rural nurse with their movable school, a memorial to Booker T. Washington*

# Wheeled Schools

## *deliver education*

*By*

WILLIAM J. MADDOX

U. S. Department of Agriculture

EMANCIPATION of a new kind is coming to the negro farmers of the South. This time it is release from agricultural ignorance, which has been a stumbling block not only of the blacks but of the entire South, for there are close to a million farms below the Mason and Dixon Line operated by negroes.

Agricultural schools on wheels are effecting the change.

It is an instance of Mohammed going to the mountain. The negro farmer as a rule is diffident about attending the regular agricultural instruction given at central points in the various communities. And the more ignorant he is the more difficult it is to get him out.

To Booker T. Washington and his faith in the simple principle of learning by doing, the new scheme of things owes its beginning and its promise of great achievement. He knew the negro farmer well enough to know that there was no hope for advancement unless modern training could be carried to his very doorstep.

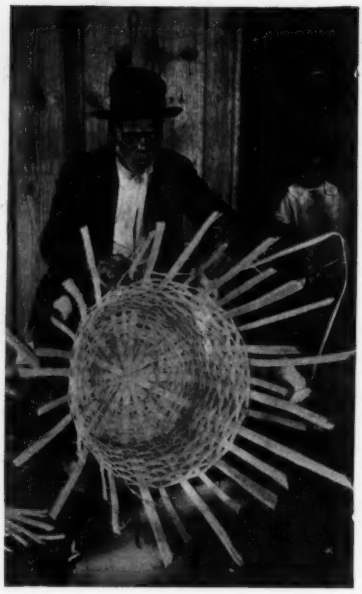
In 1906, Washington built the "Jesup Agricultural Wagon." It was fitted with farm implements, dairy apparatus, garden tools, and crates containing specimens of improved types of crops and livestock. It was pretty crowded but it managed to rumble along over the rough roads pulled by two fair to middlin' horses.

With the wagon went an agricultural extension demonstrator. Nothing more ambitious than the county surrounding Tuskegee Institute was attempted. But it was a success, so much so that later when automobiles came in, a truck known as the Knapp Agricultural Truck was substituted. This could cover more territory and

carry more equipment.

This truck has carried better farming and home-making into every county in the State where there are negro extension agents and is still in use.

BUT the scheme was to be pushed further. In 1923, by contributions from some 30,000 negro farmers and their friends, a large truck especially designed for the work was built. It is known as "The Booker T. Washington Agricultural School on Wheels."



U. S. Department of Agriculture

*A better cotton basket as a result of lessons taught by the school on wheels*

This truck carries a complete stock of farm implements and home conveniences such as the average farmer would be able to buy or construct and operate. With it goes a man to demonstrate the use of the equipment and to teach improved methods of farming; a woman to show how to make and use the home conveniences and to cook, can, care for poultry, and conduct the home on a more healthful and economic basis; and a rural nurse who gives demonstrations in care of the sick and simple practices of home sanitation and hygiene. It carries, too, a complete motion picture outfit and phonograph.

Of course, it is all very elementary. A good picture of a demonstration is given by a rural negro preacher in a letter to a county agent connected with the work.

"I am sure you will recall how reluctant I was to say I would spend four days in a movable school at such a busy season. Of course I knew nothing about it, but felt that as usual it was nothing more than the gathering of farmers to listen to a display of oratory on what a farmer could do. The order given at Monday night's meeting for all to meet Tuesday morning at 8 o'clock at the home of Mr. Cowan was about the only thing that got me out the first day. I wondered what could really happen at 8 o'clock with grown-ups. I put on my preacher suit, of course, and rode out to the meeting about 10 o'clock. On reaching the house, I found myself completely upset in my imaginations and wholly out of harmony with the work; everybody in their work clothes and too busy to see me.

"The class in terracing was in a nearby field where the farmers were given lessons on the use of the tripod and target in running terraces. Another class was standing around a large barrel where they were given lessons in the making and applying of whitewash and the mixing of stains. Other classes were in rug making, rural nursing, canning, testing eggs, dyeing, care of the sick room, poultry house building, sanitary toilet, soap making, lawn building, and in fact everything that brings to rural life more happiness and contentment. This was my first day's experience in a movable school.

"THE second day I was there on time with my old discarded handsaw and suit of overalls which fitted me for the occasion. I soon learned to sharpen and set my saw, along with 18 other farmers. We were given lessons on the use of the square and the cutting

of rafters, then on the cutting out and building of a poultry house which gave us all a chance to try our saws on cutting to the line, which everyone enjoyed. Each hour throughout the day revealed some new phase of the work.

U. S. Department of Agriculture.
*Negro agent demonstrating banking sweet potatoes for storage*

"The community welcomes the school's return at any time. Cowan's home stands out as a living demonstration of what can be done with an old dilapidated house and broken-down surroundings."

THE program is arranged with an eye to meeting the local needs of the individual community. The various groups are taught the things they prefer to learn. The course is adapted to the problems encountered.

At some time during the day the rural nurse makes community surveys of the homes and gives first-hand advice in sanitation. Special attention is given to baby welfare, the eradication of vermin—flies, bed-bugs, mosquitoes—and diseases due to unsanitary conditions. Cases of illness requiring medical attention are turned over to local physicians for treatment.

Nor is it all work when a wagon comes to a community. Play has a place on the curriculum. Strange as it may seem few of the "students" know how to play.

At the end of each day's session they are brought together. Simple games are explained and played, all including good sport and healthful recreation—volley-ball, tug of war, foot racing, shoe racing, and such.

One of the most interesting phases of this part of the program is to see the influence of sports on the old folks who thought they were past athletic activity. Even the old "rheumatiz"

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U. S. Department of Agriculture.
*A baby clinic being held at the home of a negro farmer*

*J. N. Wilson, Clyde, Texas, and a peach tree six months after it was set on unfertilized ground. Only eight inches of growth developed by the middle of summer.*

# *An* Orchard *for* Cowboys

*The story of a man who went ahead when others laughed and said it could not be done*

*By*

J. R. MASTERSON
County Agent, Abilene, Texas

"BACK in the Longhorn days, when everybody else was interested in steers, I caught a vision of an orchard and of the profit that it would yield. Cowboys liked apples and they never could get enough peaches on the cow trails to balance the ration of bacon and steaks. When I first cleared away the shin oaks, a lot of people laughed and said, 'Wilson, you're goine to grow as thin as a coyote foolin' with them things. Who ever heard of fruit trees making a crop out in this dry West?' "

J. N. Wilson of Clyde, Texas, was telling me how he happened to start an orchard. I was visiting him to see the results of some applications of fertilizers which he had recently made.

But let Mr. Wilson continue his story. He is an interesting talker.

"I knew that somebody had to do a thing the first time or nothing would be done. So I set several acres to berries, grapes, apples, peaches and plums, and waited until the trees were old enough to bear. Within three years, the first orchard of this section produced a normal yield, and the laughter that the other fellow made began to turn about. People from the different parts of this section heard that I had fruit to sell, and fan-tailed ponies kept the roads that lead to my house clouded with dust.

"Soon the Government heard about my undertaking, and a number of grape vines were sent to me to be tried out in this semi-arid West."

Mr. Wilson had noted that his old orchard was showing the mark of years. The branches were losing their vigor and the trunks were becoming rough and barky. New trees were ordered and five acres of young trees were set.

On the lower side of the young orchard, the soil was regarded as fertile enough to expect a normal tree development, but along the upper slope of the hill, the sand had leached and erosion had occurred. The potash and lime were exhausted from the dirt of the higher ground, and so Mr. Wilson fertilized the trees that were set in the depleted soil, but depended upon the native dirt in the valley section to take care of itself. Six months after the trees were set, Mr. Wilson and I made a careful study of the two areas, and the pictures duplicated here illustrate the difference in growth that was made. Nurserymen who wanted to make experiments in new territory shipped a number of varieties to be planted in the Western sand.

"Of course, insects came; immature fruit fell; and over-prolific trees threw off the surplus that the root system could not maintain," Mr. Wilson continued. "What to do with these immaturely fallen fruits became a problem. I didn't know how to make use of this under-sized, wind-blown crop. The cowboys hadn't learned to drink cider then; red whiskey had enough of the mustang's kick to satisfy the wildest Westerner; and apple juice was a bit tame for a fellow who could wrestle with a Longhorn steer.

"INCIDENTALLY I heard of our state agricultural college, and, seeking information that would promise a profitable disposition of the immature, worm-eaten, and wind-blown crop, I boarded the train that was bound for College Station. That ride profited me more than $1,000 the first year. The college specialists taught me how to preserve the undersized fruit in the can, and in a little while I had built up a profitable business in the cow camps. And every cowpuncher howled to the foreman of the ranch for Wilson's products. A cowpuncher has a remarkable palate for apple jelly and peach preserves.

*(Turn to Page 58)*

*Mr. Wilson with a peach tree six months after it was set in ground that he fertilized when the nursery stock was planted. More than three feet of growth developed by mid-summer.*

*J. N. Wilson, Clyde, Texas, and a peach tree six months after it was set on unfertilized ground. Only eight inches of growth developed by the middle of summer.*

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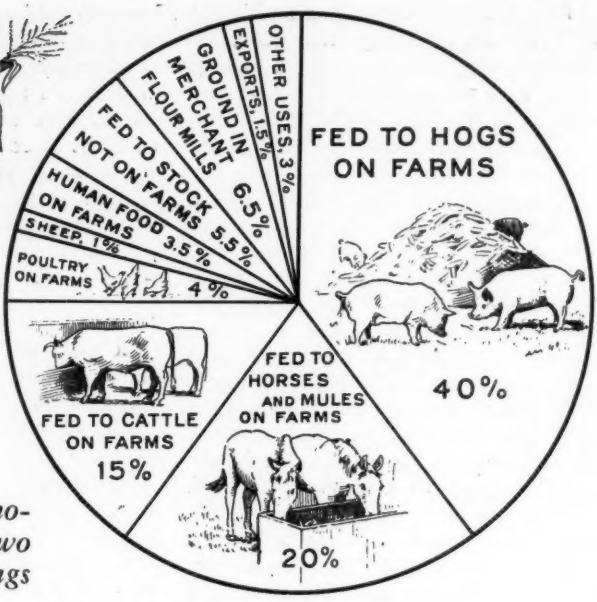
# The USES OF CORN




*Fireworks and phonograph records are two of the many things corn helps to make —*

*By* C. L. PHILLIPS
U. S. Department of Agriculture

CORN may well be called the king of plants. The treasures it yields are innumerable. Besides being food for man and beast, it has of late years entered in some form into nearly every imaginable industry, including the radio, telephone, and the manufacture of lumber, paper, starch, candy, soap, buttons, glue, oilcloth, paint, shoes, automobile tires, ice cream, and fireworks.

The chemists of the United States Department of Agriculture, the Iowa Experiment Station, and other investigators have been delving for several years into the secrets lying buried in the corncob. Through their efforts the position of the lowly cob has been raised from feed for hogs in the pen to a station in the parlor in the form of a phonograph record. This has been made possible through the extraction of a corn by-product known as furfural. Furfural is an aromatic liquid almost water-white when pure but dark in color when exposed to air and light.

This compound bids fair to become an important commercial chemical. The importance of furfural in industry is apparent when it is realized that such widely different products as printing plates, phonograph records, varnishes, substitute for hard rubber used in the making of buttons and electrical parts, pipe stems, glue, and a hundred kindred products are being manufactured from it.

PERHAPS the largest commercial use for furfural is in the manufacture of synthetic resins. From these resins can be made telephone receivers, phonograph records, radio equipment, noiseless gears, printing plates, and various other molded articles. These resins have insulating qualities, great strength, and great resistance to water

and chemicals. Formaldehyde was formerly used in the preparation of resin, but it has been learned that furfural is an excellent substitute for this purpose.

The fact that furfural is a solvent has led to its introduction in the varnish industry. It can be used as a solvent and a hardening agent. Besides all these uses Dr. Hugh McGurgan of the University of Illinois has demonstrated that furfural has decided antiseptic and germicidal properties. A small amount put in glue will keep it from going bad for several weeks. It can be used instead of formaldehyde in the preservation of anatomic specimens. The Iowa State College is working on the use of furfural as an insecticide and expects that it will have extensive application in this line. Another use for furfural is in the preparation of dyes, used chiefly for such articles as crepe paper and other temporary decorations.

IN furnishing a motor fuel for automobiles the humble corn cob may in the future run in competition with the oil wells. Dr. La Forge of the United States Bureau of Chemistry and H. P. Wolcott of the Iowa State College have reported that a successful motor fuel can be obtained by the use of furfural with mutually soluble compounds as acetone, ether, alcohol, kerosene, and gasoline. The Iowa Experiment Station report says:

"At present prices of furfural and gasoline the use of furfural is out of the question. The growing shortage of petroleum, the possible production of furfural in enormous quantities, and the possible recovery of valuable by-products may make it of importance in the future."

The method of extracting furfural is not a difficult one. The corncobs with some water and a very little sulfuric acid are placed in a cylinder or pressure cooker and digested for about two hours with steam under 135 pounds pressure per square inch.

The furfural comes out of the cobs and is blown off with steam passed through a condenser and collected as a solution of furfural in water. This solution is then distilled to separate the furfural from the water. It is possible to obtain furfural from other vegetable substances such as oat hulls and bran, but Dr. La Forge reports that analysis has shown that corncobs contain a higher percentage of furfural than is obtained from any other material. On account of the high cost of methods of producing it, only limited amounts were used in the United States in 1920, possibly 50 pounds a year and that only as a laboratory reagent. It sold for $30 a pound. Now 500,000 to 1,000,000 pounds a year are being produced by a factory located in Cedar Rapids, Iowa, and sold in Chicago for about 15 cents a pound.

But we have not yet mentioned all the possibilities lying dormant in the lowly corncob. A mucilage or gum can be easily extracted which is useful as an adhesive in the paper box industry, for wall papering, bill posting, for pasting paperbags, and for other purposes not demanding high grade, strong adhesives. Oxalic acid and acetic acids are also important by-products. Oxalic acid and its salts are largely used in the industries.

It is employed in the production of celluloid and artificial silk, purification of glycerine and stearin, leather manufacture and dressing, calico printing, bleaching of straw and wax, and in tanning. Due to its solvent properties it is used in the manufacture of blue ink, and is valuable for cleaning metallic surfaces and for removing rust and ink stains from fabrics. It is in much demand by laundries as a "sour wash," where it is used to neutralize the alkali on the clothes as they come from the wash. It plays an important role as a precipitating agent in the manufacture of rare earth products. The salts find application in photography and in the

manufacture of safety explosives.

As if this was not enough it is now proposed to utilize corncobs in the manufacture of a lumber substitute. A patent has been issued to Paul Gruber and H. C. Baschroim of Pittsburgh, Pa., for this purpose. Dr. Darling of Milliken University at Decatur, Illinois, claims that this substitute will withstand a pressure of 10,000 pounds to the square inch and that its endurance is as great as any hardwood. The material may be shaped with wood-working tools the same as lumber. It is especially desirable for making spools and it is claimed that they can be produced cheaper than similar spools from birchwood. It is adapted for making picture frames and mouldings or may be used for wallboard and many other uses where high tensile strength is not required.

BESIDES these major uses of the corn-cob many minor uses have been studied. Among these are the making of paper pulp, cardboard, and cork in the manufacture of linoleum, wood flour substitutes, and plaster boards.

The work done on the corncob has thus revealed remarkable opportunities for the profitable utilization of a product heretofore almost entirely wasted. There are perhaps 20 million tons of corncobs produced annually. These have immense potential value, and may yet become a big economic asset to the wealth of this country.

Thus far we have mentioned only the products derived from the cob. The chief products obtained from the corn kernel by the wet process are cornstarch, corn sirup, corn sugar, dextrose, grits, dextrine, British gums, corn oil, corn gluten feed, and other stock feeds, glycerine, and soap stocks.

The corn kernel may be separated into the germ, the body or endosperm, and the hull. From the germ is obtained the oil, oil cake, and oil meal; the starches, sugar, dextrines and glutens are derived from the endosperm; and from the hull is obtained the bran. From a bushel of corn is obtained approximately 32 pounds of starch, 1½ pounds of corn oil, 3½ pounds corn germ, and 13 pounds of corn gluten feed.

The corn oil is a by-product in the manufacture of starch. The oil is contained in the germ of the corn kernel which in the process of manufacture is separated from the remaining portions of the corn and dried, ground, and subjected to hydraulic pressure whereby the oil is extracted. One authority reports that corn oil can be obtained at a manufacturing cost of about 10 cents a pound. The edible corn oil is used in salad oil, shortening, frying, oleomargarine, compound lard, liniments, and camphorated oils. The crude oil enters into the manufacture of soap, paint, oilcloth, leather, and rubber substitutes. Vulcanized with sulphur trichloride, corn oil yields an artificial rubber widely used in making bottle stoppers, art gum, shoes, rubber specialties, and automobile tire fillers. The value of the oil manufactured from corn was estimated by the Census of Manufacturers to be nearly $107,000,000 in 1923. But the largest amount, about 75 per cent of the total output, is used for food purposes.

STARCH, as has been pointed out, is the principal product obtained from the kernel. From the Tariff Commission we learn that approximately 93 per cent of our starch comes from corn, about 4 per cent from potatoes, the rest from wheat, rice, and tapioca. In 1925, 86 per cent of our imported starch was potato starch. In 1923 the value of the starch manufactured from corn was nearly $29,000,000. Starch is used in the textile industry for sizes for stiffening and finishing yarns and fabrics. Confectioners use it in making gum-drops, and as a molding in casting cream centers,

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*A herd of Jersey cattle on one of the many dairy farms in Oktibbeha county, Mississippi*

# The County Cows Built

*By* SID NOBLE

A FEW short years ago Oktibbeha was a typical cotton county in the hills of north Mississippi. Its one-crop farmers, who grew only cotton and bought their supplies with cotton money, were operating very similar to the old share croppers who dumped their wagons at the master's gin, went to the commissary and drew supplies, to the smoke-house and drew meat, and thence back to their meagre acres to grow more cotton to trade for more food and meat.

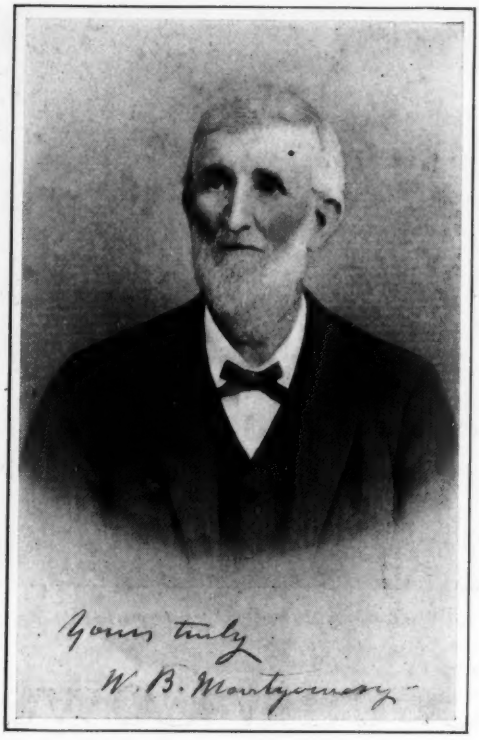
Today Oktibbeha is known as "the Jersey county of the South." Its annual receipts from dairying are about six times the value of its cotton crop. It is the location of the first southern milk condensery. Its new doctrine is diversification and the chief exponent of that doctrine is the dairy cow.

*The milk condensery at Starkville, Mississippi*

Back of this change is a story of dreams come true—the dreams of a pioneer who was a prophet of better times.

The pioneering strain has always run like a crimson thread through the fabric of the true American char-

acter. In pursuance of old ideals and new frontiers the pilgrims boarded the *Mayflower* and later, feeling the urge, the winners of the West drove their covered wagons toward the setting sun. Thus our forebears pushed boundary lines to the farthest frontiers, spurred to stubborn and relentless effort by the thirst for new horizons, by the belief that through the mist was the rainbow's end —the land flowing with milk and honey.




*Col. W. B. Montgomery*, 1829—1904

When the boundaries were established and the country was settled and populated, there began a new pioneering. The farmers came to realize their milk and honey must be wrung from the resisting soil upon which they happened to be; that instead of boarding covered wagons and setting forth once more they must pioneer with their own hillsides and gullies and their own rich valley lands.

Col. W. B. Montgomery of Starkville, Oktibbeha county, came of this new school of pioneering. This practical farmer, who was born in 1829, was a graduate of Princeton University and a devout Scotch Presbyterian. But most of all he was a man of vision. Directly after the Civil War when everywhere swords had been sheathed and consigned to rust and memories, he settled on his Mhoon Valley plantation, near Starkville, and began to look about for some path that led out of the morass of reconstruction days.

*Montgomery Hall, the agricultural building of Mississippi A. & M. College*

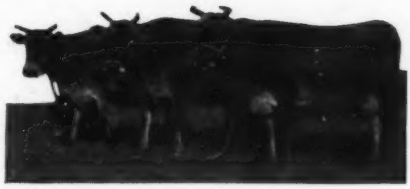
Due to constantly disintegrating lime rock in Oktibbeha soils, the cotton farmers were in a continuous battle to keep grass out of their cotton fields. Grass, to them, was a curse, but Col. Montgomery recognized it as a benediction of nature. Contrary to the general custom of a one-crop system and cotton farming, he began to preach wide diversification and dairy farming. He became owner and editor of *The Southern Livestock Journal* and built up a strong circulation through the South for this worthy magazine.

Riding about over his plantation and the surrounding country he would always carry the seeds of a variety of

good pasture grasses in his saddle bags. As he spread his philosophy of a well balanced farming he would also strew these seed along the roadways, in the fence rows, and through the meadows. Alfalfa, Johnson grass, sweet clover, and lespedeza took to the lime soil as a duck takes to water. From the Isle of Jersey he imported the sires and dams of the herds that fattened on the meadows in Mhoon Valley.

At about this time in the North another pioneer was enjoying his first sweet taste of success. Gail Borden's factory to preserve milk, at Burrville, Connecticut, had done a great service in the Civil War and was receiving nation-wide recognition and its first great stimulus.

WITH the passing of years the far-reaching influences of those two benefactors of the human race have converged in the first southern milk condensery, which has just completed a very successful first year's operation at Starkville. In realization of their dream, the rich milk of Oktibbeha Jerseys goes forth in daily shipments to market in cans flowing with milk and honey.

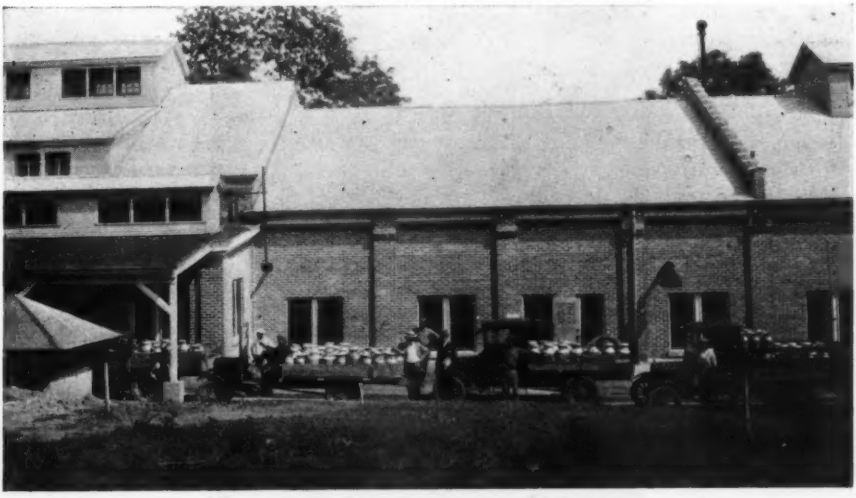


*Register of Merit Jerseys*

Today as cotton farmers are worrying over low prices and wondering how they will meet their notes, Oktibbeha bank deposits are enjoying a steady growth. The bankers are busier than ever before. The streets of Starkville have been paved, and the Chamber of Commerce is figuring on a white way. Oktibbeha farmers are on a steady pay roll now, they receive something like $150,000 per month for the milk from their Jerseys.

The first year of the first southern milk condensery has been so successful that two other similar plants recently have sprung up in north Mississippi, one in Tupelo, north of Starkville, and another in Macon, south of Starkville. The world has discovered that north Mississippi is an ex-

(*Turn to Page 59*)



*The daily receipt of milk from Oktibbeha Jerseys at the milk condensery. The trucks make regular trips over the county's network of gravel roads to collect the cans from the dairies*

# Douglas County Oregon *Pioneers With New Crops*

*By* GUY A. PETERSON
Madison, Wisconsin

OUT in Douglas county, Oregon, a semi-mountainous territory where hardly two farms are alike, there is an Irish county agent who is leading the way to better agricultural incomes for the farmers who look to him for advice. It was my privilege some time ago to sit in E. W. Cooney's office at Roseburg and interview this busy man whose forefathers lived on the Emerald Isle. Our conversation was interspersed with phone calls, conferences, and other interruptions, but I learned enough from my brief stay to assure me that the farmers appreciated the work that is being done in their behalf by this human dynamo and his staff of assistants.

Cooney is one of those rare leaders who is able to get cooperation in his experiments. Whenever he sends out a call for farmers to volunteer to make tests with new varieties of crops or carry on fertilizer trials on different soil types, he always has plenty of response. He is now watching a great many fertilizer plots on farms in various parts of his county, trying to find out just what kinds of fertilizer should be recommended under the many conditions that exist.

Among the crops which are receiving a great deal of Cooney's attention is broccoli, or winter cauliflower, rapidly becoming popular among connoisseurs of savory vegetable dishes. Broccoli has been grown within the county for nearly 20 years but it has been grown on a commercial scale much less time than that. In between phone calls, Cooney was able to tell me something about its culture.

*Number one head of broccoli in the field*

"The crop is very exacting in its requirements of fertilizers and soil types," he said, "but the dominant factor is probably climate. It cannot be grown where the temperature drops to 18 degrees below freezing during January and February

because the plants do not seem to be able to survive such an ordeal. The Umpqua valley has been found especially adaptable to this vegetable as the warm winds coming up the valley moderate our climate. The acreage has increased from 100 acres 14 years ago to 4,500 acres last year. On the whole it has been profitable and the growers have been satisfied with yields of 200 to 250 crates per acre that netted $1 to $1.35 a crate.

"WE have learned many things about this vegetable in the past five years. Possibly the item of greatest importance to the grower is the knowledge that he can get seed of known performance in the field. Originally the seed that we used came from England, France, Denmark, and Belgium and very satisfactory results were obtained. The World War, however, destroyed our foreign sources, and seed stock became a vital issue to every grower. Through planting unknown seed many farmers began to lose heavily. The climax came in 1924 when a survey of 40 or more fields showed a loss of more than $150,000 in Douglas county alone. This discovery led to a pure strain seed campaign and the organization of the Douglas County Broccoli Protective Association."

*Above: E. W. Cooney standing in the first flax field ever sown in Douglas county, Oregon. This five-acre plot yielded 18 bushels per acre.*

*Below: The man in this Douglas county oat field is six feet tall. The soil must be well supplied with potash to make tall oats stand up.*

IT is impossible to tell by looking at broccoli seed just what it will produce, because some strains are not adapted to the climate. Some shoot seed stalks and produce non-heading plants. To find out what could be successfully cultivated in Douglas county, the protective association secured 40 strains of seed and planted them in two demonstration plots. Two hundred plants of each strain were set out during July and given thorough cultivation. Four lots of each strain of seed were kept in the vaults of a Roseburg bank to be held for checking, because they tested every lot of seed before it was given out to the members. I was very much interested in this because it is not often that one finds seed so valuable that it must be kept under lock and key in safe deposit vaults.

As a result of this work 80 per

cent of the broccoli plantings in the county last fall were from the two best strains of seed as indicated by the trials. What is more, 75 per cent of the entire seed reserves represented by certain of these plots are now in the bank vaults awaiting final check.

Along with the seed testing work Cooney laid out some fertilizer demonstrations in cooperation with Prof. F. E. Price of the Oregon Agricultural College.

Tenth acre plots with nitrate of soda, sulfate of ammonia, sulfate of potash, muriate of potash, acid phosphate, and complete fertilizers are being made. Cooney summarized last year's figures as follows:

"THE most outstanding results were secured with acid phosphate and with complete fertilizers carrying high percentages of phosphates. The results were so outstanding in the matter of frost resistance that it was thought best not to hold a field day at the plots until we could definitely determine if the acid phosphate should be given the entire credit."

This does not mean that phosphates alone are recommended for broccoli but that they appear to have an important place in the fertilizing system. Broccoli takes much the same elements from the soil as does cabbage, and so some county agents advise that the same fertilizer treatment be given for both of these crops. In Josephine county, Oregon, a bulletin issued by the Grant's Pass Chamber of Commerce recommends the use of a complete commercial fertilizer called No. 2 truck fertilizer at the rate of 500 to 1,000 pounds an acre. Of course the original character of the soil will determine just how much of any plant food will be desirable to apply.

Flax is another new crop which in all probability will find a place in the rotation system of many Douglas county farmers since Cooney has shown its adaptability. Little was known about this crop, but Cooney thought it could be profitably grown, and so he got one of his old standbys, J. H. Parrott, to run some tests on it. Parrott agreed to sow 40 acres in five-acre lots at intervals of one week upon the various types of soil on his farm. The entire planting averaged 13 bushels of seed to the acre which sold for $3.25 a bushel. The best yield was 18 bushels per acre secured on a field that had been in Canadian field peas two years before. May 10 seemed to be the best date for planting flax on Parrott's farm last year.

Cooney is not only introducing the idea of growing pedigree Grimm alfalfa seed, but he is studying the pasture and hay problem from other angles as well. In the past few years Ladino clover has been getting considerable attention in the western states because of its perennial characteristics and its fine pasture qualities where winters are not too severe and where plenty of water can be secured. Two years ago, Cooney got enough Ladino seed to plant an eighth of an acre on J. H. Parrott's farm. He said it was hard to believe the results but a two-ton crop of hay was cut from that measured field last year. If further trials show up half as well, Cooney is confident that there will be many acres devoted to this crop in the future.

COONEY has a small farm of his own where he can test some of his ideas and keep in closer contact with his work. He believes that winter pod peas will soon become an important enterprise in his county. Last year on this farm he got two tons of pods per acre that sold at an average price of 9½ cents a pound. These peas were in full bloom by March 25. He planted them in paired rows, the pairs

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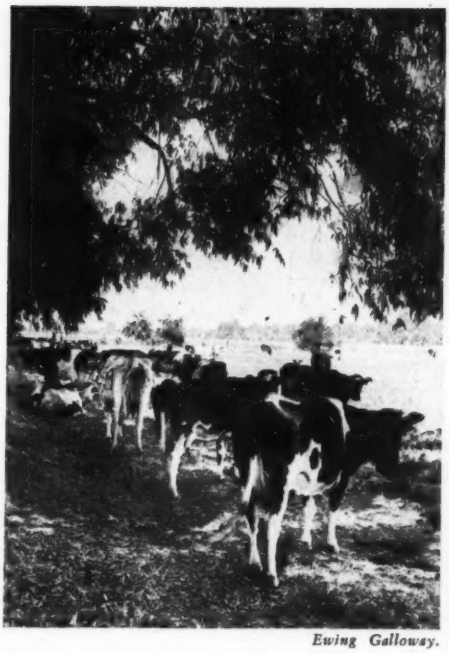

*Ewing Galloway.*

*Healthy cattle need plenty of good hay. Here's an article on the productive capacity of meadow and pasture.*

# Hay

*By* ROBERT STEWART

Dean of Agriculture, University of Nevada

THE typical meadow and pasture region in the United States comprises the northeast portion of the country and includes all of New England, New York, Pennsylvania, portions of West Virginia, Ohio, Michigan, Minnesota, and Wisconsin. The distinctive agriculture of this region has developed a special problem in soil fertility which is of grave concern to the producer, and its successful solution offers much of profit and satisfaction in farming.

From the nature of the soil, climatic conditions and markets, much of the land *must be* in permanent pasture or meadow, and the short lived legumes do not fill the bill of requirements. It has been hoped by some investigators that alfalfa, the king of forage crops in the West, might be successfully introduced into this region and, in a measure, supplement grass. Facts, however, indicate no such trend on the part of the farmers of this region. In 1919 there were 1,163 acres of alfalfa in Massachusetts; five years later there were only 1,273 acres of alfalfa, a gain of 110 acres. There are 457,000 acres of hay land in Massachusetts! There is no evidence here that alfalfa is growing in popularity in New England.

The farmer of this region is, therefore, practically limited to the use of a grass hay crop. The crop mostly used is timothy although the "timothy" hay of a large portion of the area is really quack grass. The fact that much of the land is in permanent meadow or pasture, and the further fact that legumes are not used, makes the problem of maintaining the productivity a very difficult one and worthy of careful consideration.

WITH a few notable exceptions the yield of hay and the carrying capacity of the pastures of this region are very low. The five-year yield of hay from 10 typical states of this region will show this.

*Yield of Hay—Average 1921-25*

| *State* | *Yield in short tons* |
|---|---|
| Maine | 1.13 |
| New Hampshire | 1.15 |
| Vermont | 1.38 |
| Massachusetts | 1.31 |
| Rhode Island | 1.30 |
| Connecticut | 1.29 |
| New York | 1.32 |
| New Jersey | 1.48 |
| Pennsylvania | 1.36 |
| Ohio | 1.33 |
| Average for Region | 1.31 |

The yield of alfalfa hay in the four states of California, Nevada, Oregon, and Washington in 1925 was as follows:

| *State* | *Yield in short tons* |
|---|---|
| California | 4.20 |
| Nevada | 3.60 |
| Oregon | 3.00 |
| Washington | 3.00 |
| Average | 3.45 |

The yield of hay in the typical hay region of the northeast quarter of the United States is distinctly low in comparison with the yields of alfalfa in the natural home of this premier forage plant. If alfalfa cannot be grown in the meadow and pasture belt, some effort should be made to increase the yield of such hay crops as can be grown. How can this be done?

The pastures and meadows of Great Britain and Europe are world renowned for their richness and excellence. Every one who visits the British Isles is surprised at the condition of the meadows and pastures on the farms. Perhaps a consideration of the methods followed by the British farmer will be of value in assisting us to solve our problem of better meadows and pastures in America.

There are two important things the English farmer does which materially assist in maintaining the excellence of his meadows and pastures. He uses a *mixture* of grasses and he *top-dresses* his meadow and pasture with fertilizer. The American farmer as a rule does neither.

At the Rothamsted Experiment Station in England there is a park of about seven acres. This park has been in permanent grass as long as there is any record and probably has grown grass continuously for several centuries.

In 1856 experiments were commenced on this park to determine the best method of increasing the yield of grass. Previous to this date all portions of the park were apparently of equal value. The park was divided in 1856 into a number of different plots, and each one received a different treatment.

The average yield of crop in these plots from 1856 to 1912 shows a very marked difference. The yield of hay varied from 2,090 pounds on the untreated soil to 7,330 pounds on the plot receiving *full fer-*

(*Turn to P. 53*)

*Large field of buckhorn which grew from what was supposed to be clover seed on an Indiana farm. Farmers can't be too careful in buying pure seed. The buckhorn will be hard to kill.*

# The N.F.A. Convention

## *Annual gathering of fertilizer men at White Sulphur Springs proves an outstanding success*

*By* THE EDITORS

THE most successful fertilizer convention in seven years was held in June at White Sulphur Springs, West Virginia. More than 400 people were in attendance, which is a larger number than last year. There were present executives of fertilizer manufacturing companies from some 30 states, and a score of the world's leading soil scientists from England, Germany, France, Italy, Russia, and other countries. The spirit of the convention was optimistic; it showed faith in the future of both agriculture and the fertilizer industry.

Much credit is due the committee, which organized the convention; and appreciation is also due the speakers who gave of their time and experience for the benefit of all.

The convention was fortunate in being able to prevail on Sir John Russell, Director of the Rothamsted Agricultural Station, England, to give a very instructive and entertaining address on "Eighty-Five Years of Fertilizer Experiments at Rothamsted, 1842-1927." The speaker showed that the chief development in the use of fertilizers, during the last 50 years, has been to stabilize crop production and make it more profitable. A complete report on this address will be found on another page of this magazine. Every man interested in using or selling fertilizers should have heard this address.

In line with the tendency in all industry, special stress was laid on the field of larger markets and better methods of merchandizing. The chief speakers in this field were C. C. Parlin, who spoke on "Seeking Larger Markets." Mr. E. St. Elmo Lewis gave a very instructive and stimulating talk on "Better Selling, Bigger Markets, Better Profits." This speaker emphasized particularly the importance of sound advertising campaigns and the folly of overproduction. "Foreign Market Possibilities" were discussed by C. C. Concannon who showed plainly that international movements in the fertilizer trade are taking place and must eventually be considered by the National Fertilizer Association. The value of surveys in finding fertilizer possibilities was shown by H. R. Smalley in a talk on "Enlarging the Fertilizer Market." The urgent necessity for supporting trade organizations was discussed by W. Bishop.

THAT city prosperity cannot be divorced from a sound agriculture, in fact is quite dependent on it, was shown by Virgil Jordan in an able address on "The Agricultural Problem." This problem, the speaker showed, cannot be solved in any casual manner. It calls for real statesmanship and real thinking.

Last, but by no means least, the well known president of the association, Spencer L. Carter, as always gave a very interesting and profitable annual address. In few words Mr. Carter pointed out the necessity for clear thinking and facing the facts. Far-reaching changes are taking place in

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# YANCEY SWANSON
# *Practical Farmer*

## *Here's a Georgia farmer who has found the formula to successful crop production*

*By* H. T. MADDUX

FORTY-FIVE bales of cotton on 40 acres!

That is the 1926 record of Yancey Swanson of Campbell county, Georgia. As a result, Mr. Swanson and his sons, Allen and Harry, are recognized as the best farmers in the section.

Down in Campbell county some weeks ago I found every one talking about the Swansons. I asked Mr. Swanson how and why he made better crops than the average farmer of the section.

"I don't use much more fertilizer per acre than they do," he said, "but I am very enthusiastic about potash.

"I use five or six per cent for cotton," he continued. "I wish I could find out how much potash can be used profitably for cotton here. My neighbors have always said this land contains plenty of potash and that we don't need much. I believed it until C. V. Shirley came here as county agent about four years ago.

"Mr. Shirley started me using a lot of potash and as a result I have been making more cotton than I ever did in my life. I used 400 pounds per acre of a mixture running about 10-5-5 last year and made 45 bales on 40 acres. I don't have much trouble making a bale of cotton to the acre. In fact I made that much in 1925 when it was so dry.

"I make big, full-sized bolls clear up to the top of the stalk and it is easy to pick. I don't make any more finger-nail cotton since I started using plenty of potash. In the fall labor often leaves other farms and comes over to me because the picking of cotton is so easy here," continued Mr. Swanson.

The average yield of lint cotton per acre in Campbell county was 177 pounds in 1924, 122 pounds in 1925, and 150 pounds in 1926, according to government estimates. Mr. Swanson averaged 562 pounds per acre in 1926 on his home place.

"Does potash pay with corn?" I asked.

"I HAVEN'T found a crop that potash doesn't make better on this red and gray land," he said. "I use acid phosphate, nitrate of soda, and plenty of potash under my corn just as I do for cotton, except in smaller amounts per acre, and then top-dress later.

"We farmers are continually advised to grow plenty of food and feed crops. I sell corn every year and my boys have some corn to sell also. I even sold corn in 1925 when it was so dry. I haven't planted any corn this year because I have enough to do me another year.

"Talking about potash reminds me. For the last four years I have noticed that my corn matures better and the ear often grows out of the shuck. This never happened that I know of before I began feeding it plenty of

potash.

"Doesn't potash make sweet potatoes, though! The boys planted a few acres last year and they must have used from 12 to 15 per cent potash under them. I thought they would never get through hauling. We are putting 35 acres in sweet potatoes this year, and 275 acres in cotton. We bought seven tons of muriate of potash and we are out already," concluded Mr. Swanson.

AT this time Allen Swanson arrived.

"Is there any money to be made from farming these days?" I asked Allen.

"Well I guess so," he said. "Last year I bought 50 acres of fairly level land that had been laying out for several years. I didn't know whether I was doing the right thing or not, and so I didn't tell Dad a word about it until I began clearing off the bushes and small trees. Four acres were planted in watermelons, 16 acres in cotton, and 12 acres in corn. I used 400 pounds per acre of a 10-4-5 fertilizer and made 14 bales of cotton. The place cost me $450 and I figured that after paying my fertilizer bill I had about $1,400 worth of crops and money on hand."

I was preparing to leave when Harry Swanson arrived.

"Harry, tell us about that cotton you planted three years ago when you couldn't get any sweet potato plants," said Mr. Swanson.

This is Harry's story:

"It was about the first of March when I fixed two acres for sweet potatoes, using 300 pounds of acid phosphate, 300 pounds of cottonseed meal, and 300 pounds of muriate of potash per acre. I bedded on this fertilizer, intending to set out my plants about the first of May. But I couldn't get any plants and things rocked along until the last check which I sent out

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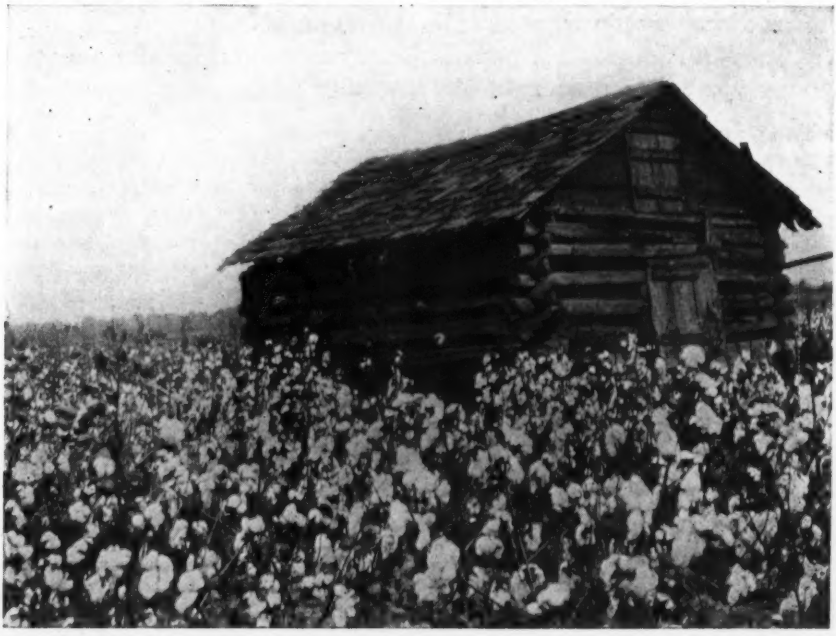


*The cotton house shown above is an old style structure but the cotton around it was grown by modern methods. Methods of better cotton growing are described in this story which tells how one farmer proved they were successful by producing 45 bales on 40 acres.*

*Agricultural Building, University of Idaho*

# IDAHO

¶ *Another of our series.*

## *By* E. J. IDDINGS

Dean of Agriculture and Director of the Agricultural Experiment Station.

IDAHO is a State of great diversity of soil and climatic conditions. The altitude ranges from a little over 600 feet in the Lewiston valley to more than 6,000 feet in the Teton basin. Rainfall in regions where farming is practiced varies from eight to ten inches in the Snake River plain to more than 25 inches in certain of the State's non-irrigated farming regions. Under conditions in this State, it is impossible for a single experimental farm, no matter where located, to render adequate service to farming interests.

To meet the situation, three substations were included in the original organization plan when the Idaho Experiment Station was established in 1892 by action of the board of regents. One of these stations was located near Grangeville in central Idaho; another near Nampa in southwestern Idaho, and the third near Idaho Falls in southeastern Idaho.

In 1896 the three substations were abandoned. The report of the decision to abandon gives as reasons that their upkeep was too high and too far away from the main station, and that they kept the main station poor

*Some members of the experiment station staff. Director Iddings is seated, second from the left, on the front row.*

and unable to function properly. However, as the agriculture in the State developed, substations became necessary and were established from time to time. The present plan for Idaho provides five experimental farms and several field stations and points of contact with special experimental problems.

The branch station at Sandpoint serves the cut-over regions. The central farm at Moscow conducts investigations of interest to a large farming region in the north-central part of the State. The irrigated farm at Caldwell is maintained to deal with the peculiar soil problems of southwestern Idaho and to serve as the location for important animal feeding and dairy cattle management studies.

The irrigated crop section, conducted in cooperation with the Federal Office of Crops and Diseases, is located at Aberdeen. The substation to deal with the problems of high altitude, non-irrigated farming is at Felt in the Teton basin at an elevation of over 6,000 feet. The entomological field station at Parma is maintained at this point because of easy access to insect problems of both orchard and field crops.

THE Idaho Experiment Station, therefore, like the stations in other States, is engaged in a comprehensive and carefully organized program of investigation to determine new knowledge for farmers and to interpret

agricultural science into methods and results that can be directly applied to the more important economic problems in farming and home-making. These methods and results are carried to the farmers by the station through its cooperating partner, the extension service, and published reports.

The first bulletin of the station was published in 1892 to acquaint the public with the new organization and plans. It was written by Robert Milliken, professor of agriculture, and first director of the station. The first annual report was submitted in 1894 by Charles P. Fox, who succeeded Director Milliken, following the latter's resignation. F. B. Gault, president of the university, became director after Mr. Fox resigned. Joseph B. Blanton, who succeeded Mr. Gault as president in 1899, continued to act as director, and President James A. McLean, who succeeded Mr. Blanton in 1900, was director for two years. In 1902, Hiram T. French, agriculturist, became director. In 1910, he was succeeded by W. L. Carlyle, animal husbandman.

Three of the present substations were established under the administrations of French and Carlyle. The Caldwell station was established in 1908; the Aberdeen irrigation section station in 1911; and the Sandpoint substation in north Idaho in 1913.

J. S. Jones, chemist, became director in 1914. The Felt high altitude substation, under his administration, was established in 1917. He was succeeded in 1918 by E. J. Iddings, animal husbandman. Dean Iddings has served since that time. In addition he is dean of the college of agriculture and director of extension.

Idaho has now in progress studies on more than 100 separate projects or distinct lines of work dealing with soils, animal feeding and breeding, insect studies, plant and animal disease investigations, research in bacterial action, study in agricultural economics and marketing, and work in many other phases of farm management, crop production, and animal keeping.

Among some of the interesting and important results of work done on crops may be mentioned the fact that red clover has been found to act as a perennial producing satisfactory yields over a four and five year period. It yields better than alfalfa in the cut-over section of Idaho.

Rustlers white dent corn has been bred up so that it produces satisfactory corn yields in many of the cooler sections of the State. Sunflowers are recommended now as a valuable dairy silage crop. Seeding of peas just as soon as the soil can be prepared in the spring has been found to be the best practice. The same is true of grass and legume seedings. The use of nurse crops has been found to be inadvisable in non-irrigated areas.

THE development of Mosida and Federation wheats, Idamine oats, and Trebi barley have been major contributions of crop experimental workers to Idaho's agriculture. Mosida wheat proved to be the highest yielding variety for the northern cut-over sections. It is a beardless red winter variety, a cross between Fultz Mediterranean and Turkey Red.

Federation wheat, a soft white early maturing variety introduced from Australia, is well adapted to the entire irrigated area and is becoming very popular. Idamine oats, a mid-early variety developed from Silvermine oats, is a high yielding variety for the irrigated sections and is well adapted to the entire State.

Trebi barley was introduced by the United States Department of Agriculture. It is a high yielding, spring seeding variety adapted to the entire State.

In Idaho the agricultural experiment station is charged with the responsibility of handling the pure seed work and with the maintaining of

(*Turn to Page* 46)

# Eighty-five Years of Fertilizer Experiments

*Address of Sir John Russell, Director of the Rothamsted Experiment Station, Harpenden, England, before the National Fertilizer Association Convention, White Sulphur Springs, W. Va., June 8, 1927*

Reported by G. J. CALLISTER

JOHN BENNET LAWES, owner of the Rothamsted Estate in England, was the first agricultural scientist who also managed a very successful fertilizer business. In 1840, under the necessity of growing larger yields of fodder crops of turnips, Lawes experimented until he found that rock phosphate treated with sulphuric acid produced an effective fertilizer for increasing his turnip yields. He patented the process, set up a factory in London, and continued to manufacture acid phosphate for many years.

But turnips were only one crop. Wheat was important. Barnyard manure had been used up to that time and gave good results. It was not, however, obtainable in sufficient quantities. John Lawes, therefore, started the now famous experiments on wheat at the Rothamsted Experiment Station.

He proved that artificial fertilizers could be compounded for wheat and used even more successfully than barnyard manure. Realizing the importance of his discoveries he induced a young chemist, J. H. Gilbert, to join him. Together they showed that artificial fertilizers could give great increases in crop yields, but then, as now, the fertilizers were not always effective. Sometimes they acted well, sometimes they did not. Prices of farm produce fell, labor rose, and hard times came upon farmers. It became important, both for agricultural science and for the fertilizer industry, to know more precisely the conditions under which good effects might be expected and when less favorable results were likely to follow. A disappointed farmer is just as bad for the scientist as for the manufacturer, and it is in the interests of both to gain knowledge so that farmers can be told quite definitely whether fertilizers are likely to help, and, if so, what fertilizers—if not, what else they can do to get better crops.

OF all fertilizers the most uniform in their action are the nitrogenous. In the humid conditions of England, 1 pound of nitrogen gives about 12 to 18 pounds of wheat, barley, or oat grain; 120 pounds potatoes or 120 pounds hay, so that 1 cwt. sulfate of ammonia per acre will commonly add 4 or 5 bushels of wheat, 6 or 7 of barley, 7 or 8 of oats, 20 cwt. potatoes or hay to the crop. The figures vary less from district to district (taking the average of several farms) and from season to season than might be expected. There may be considerable variation in the basal yield, but much less in the increase given by the nitrogenous fertilizer. Similar results are obtained by Lemmermann of Germany.

Phosphates and potassic fertilizers are much less regular in their action; in some seasons they are very good, in

others they are apparently useless. In the Rothamsted experiments the phosphates act well in cold, wet seasons when crops are liable to fail and when, therefore, food for animals is scarce and dear. Thus in 1920 there were only 3 tons of Swedes per acre on an unmanured land and 9.3 on land manured well with sulfate of ammonia and potash, but 16.3 tons where the land received phosphates in addition.

Those farmers who had used no phosphate had insufficient food for their animals and so were driven to selling them at a time when buyers were scarce. Those who used the phosphates had sufficient food to keep all their animals and even to buy some that were going cheaply. In bad seasons the difference between a large crop of animal food and a small crop is much greater than the mere figures of tonnage suggest. Therefore, phosphates are regarded as good insurance against bad seasons, and farmers are advised that if the season is good the phosphates may not help; if it is cold and wet the phosphates will probably save the crop.

IN like manner potassic fertilizers are very beneficial to potatoes in times of spring drought. One cwt. sulfate of potash per acre has given increased crops varying from nothing up to 58 cwt. per acre, according to to the rain in spring—nothing when there were good rains and good crops —25, 40, 50 or more cwts. when there were drought and liability to failure and therefore a premium on good crops.

At Rothamsted scientists are devoting much time to the study of these seasonal variations. Two methods of investigation are followed: 1, to get all the facts by more accurate field experimental methods; 2, to make complete observations of the climatic conditions and their effect on fertilizer usage.

As a result of this research work a number of correlations between the fertilizers and the weather have been worked out by the statistical department of Rothamsted.

The main object in doing this work is to put the results into the form of tables of expectancy of crop yields, similar to the tables of expectancy on which life insurance is based. Thus, if a farmer adopted the recognized system of fertilizing, best calculated to stabilize his yield, he could insure his returns at a reasonable premium.

REGARDING the value of barnyard manure as to insurance against bad seasons, the record of experimental work shows that manure is very valuable. It breaks no records but in bad seasons it never fails. A proper combination of barnyard manure and artificial fertilizers gives the best and steadiest results.

The phosphates act well in cold, wet seasons; the potassic fertilizers help in the dry, hot seasons; the barnyard manure is good in dry, cold or dry, hot seasons, while the nitrogenous fertilizers are nearly always good. The fertilizer thus acts as a buffer between the crop and the season, straightening things out and making for constancy of yield. Such steadiness of yield is obviously in the farmer's best interest.

It has been found that the seasonal effects express the varying results of the plant to the fertilizer in varying conditions.

Nitrogenous fertilizers increase the rate of growth of the plant and the size of the leaf. They induce a bulky growth very good for vegetables. The problem is to be able to use enough nitrogen without causing lodging of many crops.

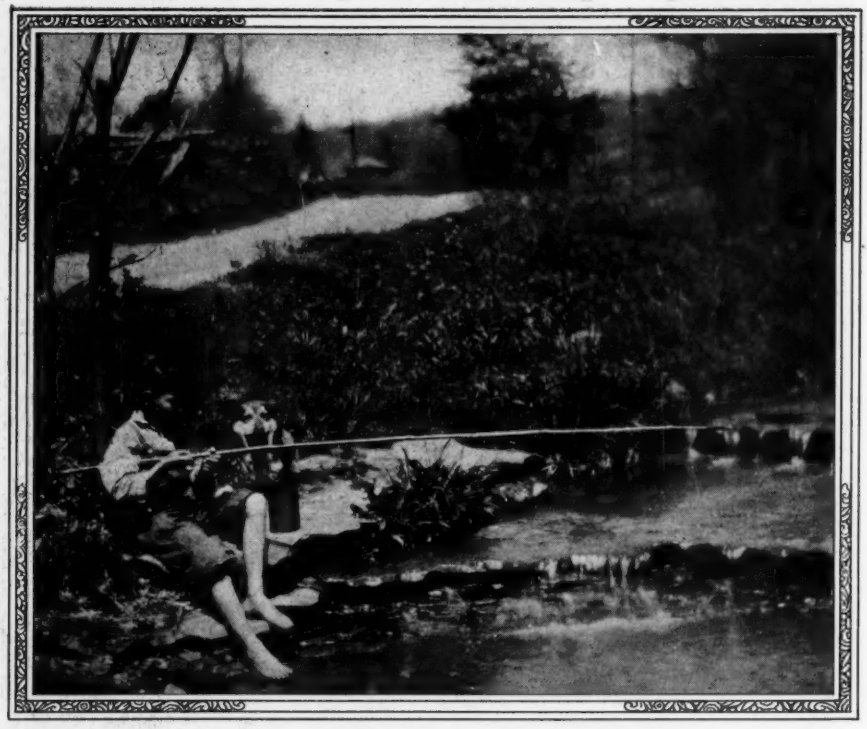
Phosphatic fertilizers improve the root development and tillering of cereals and hasten the development of grain, effects which are very valuable on heavy soils in cold, wet seasons.

Potassic fertilizers in the Rothamsted experiments have shown two re-

(*Turn to Page* 55)

# Pictorial

*SUMMER heat gives these cows little worry and the pigs below are wholly unconcerned over the fact that thirteen are at the dinner table. Other benefits of farm life in July are pictured on the next two pages.*



*Ewing Galloway.*

*One of the most outstanding phases of activity of the U. S. Department of Agriculture is its club work with boys and girls. Shown on this page are two Lowndes county, Mississippi, club members demonstrating a well justified pride in their crops.*

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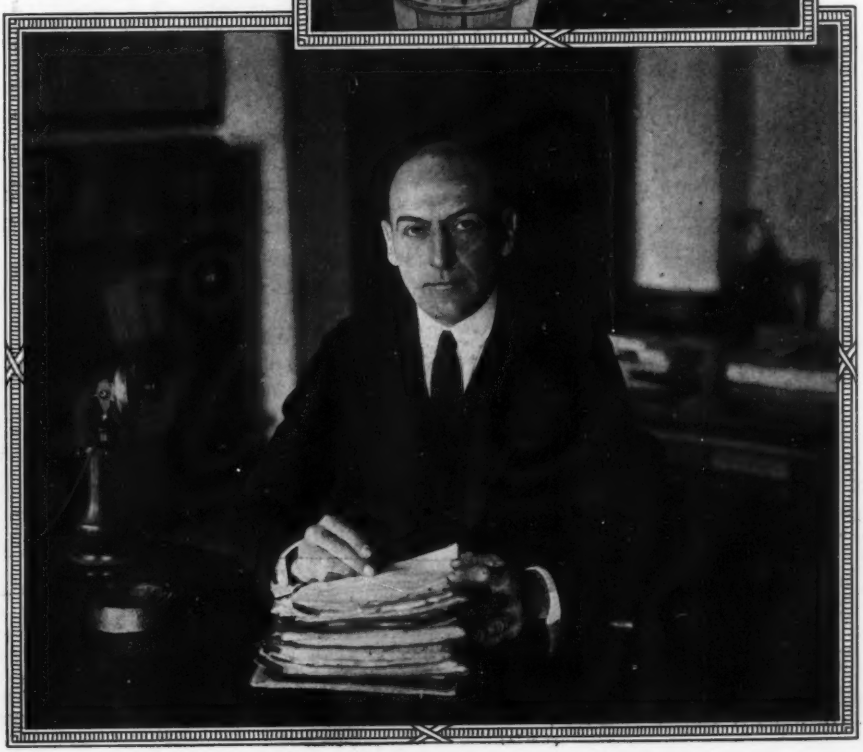
*The berries, shown on the opposite page, are a result of other work of the U. S. D. A. Many years ago a Mr. Young of Louisiana developed a new berry by crossing the Mayes dewberry with the phenomenal blackberry. After a time he discarded this hybrid but he had given some plants to a friend in Pennsylvania. Years later this friend sent some of the plants from Pennsylvania to the Bureau of Plant Industry of the U. S. D. A., and discovery was made that this fruit, having most of the characteristics of a dewberry, was better in flavor and appearance than any other dewberry known. Especially suit-*

*able for the South and Southeastern States, during recent years the Young dewberry has been grown at the Coastal Plain Experiment Station, Willard, N. C., and the berries shown in the picture were shipped from that station to the Washington market.*

*Below: Reorganization work in the Department of Agriculture has split off the regulatory work from the Bureau of Chemistry and placed it in a separate branch of the Department of Agriculture along with the regulatory work having to do with insecticides and fungicides. The new administration, which went into effect July 1st, is called the Food, Drug and Insecticide Administration and the new chief is Walter G. Campbell who is also Director of all the regulatory work in the department. Mr. Campbell was at one time acting chief of the Bureau of Chemistry and was a part of that organization for a great many years.*



*W. M. Jardine, Secretary of Agriculture, is shown here with his son, Bill (not William) who will start on his own at the age of 18 to get a job in Kansas City for the summer, and this fall enter the Kansas State Agricultural College in Manhattan, Kansas. Bill hopes to earn enough this summer and at odd times to pay his way through college.*

*The Clayton county, Iowa, team of club boys and girls who won the International Junior Judging Contest is now in England to participate in the junior judging contest at the Royal Livestock Show held near London this year. Left to right on the front row are: Professor Fordyce Ely and Director C. W. Warburton of Iowa State College; the 4-H judging team composed of Gertrude Kaiser, Kenneth Walter, and Lloyd Kaiser; and Roy Combs, county agent of Clayton county. The others in the picture are officials of the U. S. Department of Agriculture. Miss Kaiser is the first girl who has ever represented this country in international competition in livestock judging.*

# The Editors Talk

WE all know the life insurance agent. Soon there will be crop insurance agents, at least in Great Britain, if the hopes of Sir John Russell and his colleagues come true. This crop insurance is based on the use of fertilizer.

CROP INSURANCE

Briefly it has been found that the proper fertilizers stabilize yields. In other words, the fertilizer acts as a buffer between the crop and the season, straightening things out and making for constancy of yield. As shown by Sir John Russell the yields of potatoes for four years on inadequately fertilized land varied considerably. The range in yield for this period, under the same fertilizer treatment, was 80 per cent. But on properly fertilized land the yields for the same four years varied only 18 per cent.

Using certain basic figures for the weather conditions over a long period of years and figures for the yields of crops under certain fertilizer treatment, it is hoped to put the results of such correlations into the form of "tables of expectancy of crop yield," in the belief that an insurance business might develop in which farmers who use the right form of fertilizing could insure their returns at a reasonable premium.

Certinly this is a long step towards taking much of the guess out of farming. It is made possible by long years of work along the same line. It shows that to accomplish anything, especially in agriculture, a great deal of patience and steady well planned work is required as a preliminary undertaking. Profitable short cuts are rare. The house falls down and has to be built all over again. If the guess can be taken out of the fertilization of crops, why not an effort to take some of the guess out of agricultural business that deals with the farmer and his products?

This is a big field, it offers big possibilities; much more work should be done than is being done.

WELL, it's July. A multitude of boys have finished their four years at agricultural colleges. Each has a degree, and doubtless many of this multitude are wondering just what they are going to do now that they have got it.

GRADUATES

To make the most of a scientific agricultural education in these days it takes a great deal more thought than it did years ago. In the past a limited number of fields were open to the college graduate, his choices were limited. Either he could work on a farm or work for an experiment station, and circumstances usually very quickly decided which was the job he would do.

But conditions have changed. The situation is much more complex. The range of jobs is much wider. The student must enlarge his horizon and consider a broader field. Agricultural business in many phases is drawing large numbers of men. Business is becoming receptive to the college-trained man. This is shown in a striking manner in an address of the president of the National Fertilizer Association, Spencer L. Carter, who points out that to obtain good men in the industry men who have had either a good school or college education should be selected. It is not difficult to get such men at present in view of the existing school situation throughout the country.

Mr. Carter goes on to point out that such men properly trained in the office and factory would help to stabilize business, to conduct it on a higher plane, and render better service to the buyer as well as the fertilizer industry.

But will the graduates of our colleges see the opportunity or will they disdain it because it is connected with business? Before the college trained man can render the highest service to agriculture, we need to get rid of a great deal of loose thinking regarding money and business. The college graduate often needs to develop the attitude that business is an important part of the world's work; that good business well done is as high a service to the agriculture of our country as any other form of work. Many graduates will see this and capitalize, for the good of themselves and agriculture, the opportunities that are fast increasing. We wish them every success.

## ADVERTISING

EVERY business man knows that if he is to make a success of his business he must make known the merits of his goods.

Advertising is not anything new. It has been done since man began to produce in excess of his needs. As civilization has advanced with the ever increasing demand for products of the farm and factory; as competition has become a factor in world commerce, the need for better means of advertising has become imperative.

In big business today, advertising is the fifth wheel of the organization. Large sums are annually spent in conducting this work.

American advertising agencies stand out prominently as leaders in this field. Other countries are looking to us for guidance in the establishment of sound, profit-making practices in advertising to help in the solution of their economic problems.

Everywhere we confront the "Buy From Us" argument. In newspapers, magazines, posterboards, printed matter, window displays, electric signs, novelties, motion pictures, radio, and in public conveyances, we are asked to buy and try.

That advertising pays is evidenced by the increase in budgets for this purpose over a period of years. Even bankers have changed their attitude of opposition which at one time prevailed. Today many bankers strongly recommend advertising for their clients. Cases are known where bankers acting as receivers increased advertising and thereby quickly emerged from receivership.

What will help big business should likewise help in farming. Farmers as inviduals or as associations have successfully employed advertising. As a national practice, however, farmers have not adopted it.

Until the American farmer, representing billions of wealth, accepts advertising in the same light as the business man, we shall hear of the down-trodden, discouraged, bankrupt farmer.

Farm relief measures, whatever be their object, cannot overcome the ills of agriculture. We must go deep into the bed rock and build a solid foundation, based on fundamental facts.

That there is a problem requiring solution cannot be denied. Neither can we deny that a bankrupt agriculture will not ultimately affect other lines of business. To think that agriculture so essential to our national prosperity can remain on a financial basis below that of other industries without affecting them would be absurd. Farmers must be recompensed equably with other lines of business.

What is defeat? Wendell Phillips says, "Nothing but education; nothing but the first step to something better." Phillips is right.

Farm relief legislation was defeated—but possibly it was best that it was so declared. The important fact remains however—the farmer is not defeated—he has but made another step towards something better.

Education, well balanced, coupled with judicious advertising is a team with which the American farmer will solve his own economic problems, and we heartily recommend that all agencies, law-makers, politicians, bankers and farmers work with this in mind.

## INTERNATIONAL CONGRESS OF SOIL SCIENCE

THE first International Congress of Soil Science is over. Most of the countries of the world sent some of their people who had studied the soil of their own country. They gathered in Washington and met together in six different groups to study soil mechanics and physics, soil chemistry, soil biology, soil fertility, and soil classification and mapping. The sixth group studied the application of soil science to land cultivation.

The largest delegations came from Russia and Germany. England was represented by members of the staff of the Rothamsted Station. The state agricultural experiment stations and the United States Department of Agriculure were well represented.

Research on soils now has reached the point where the number of questions involved demands that such a congress be held as a clearing-house for ideas and for defining methods and technique. The soil is one of the commonest things we know in every-day life and yet it is the source of some of the most baffling problems known to the scientist. The first great problem is to classify the soils of the world to know exactly what are the resources for the world as a whole measured in terms of crop production. Therefore, much interest was shown in the systems of soil mapping adopted in different countries.

The leaders who organized the Congress are to be congratulated and the business organization which made possible the meetings and transcontinental excursion deserve sincere appreciation for their generosity.

It is hoped that the example of this first International Congress of Soil Science will lead to further international meetings that will help to find the solution for many of the problems now confronting us. In the last analysis business prosperity depends on a sound and prosperous agricultural condition. The basis of all prosperity is a fertile soil.

The business man can well afford to support the soil scientist.

## ORGANIZATION

ON every side, wherever we go, whatever our business, the password is ORGANIZATION.

Let's see if we know the meaning of this word. Many people believe an organization to be a necessary medium for pooling local social interests, as the "Needle and Cotton Club," the "Shanghai Sheikers" or possibly the "Riders of the Headless Horse." The average person of intelligence regards organization as a means of securing prestige in the trade, social, fraternal, or business world. Webster defines organization as "any vitally or systematically organic whole."

Regardless of personal opinions, it is fundamentally sound to say that any organization to be worthy of recognition must be vital to the needs of its constituents, and it must be systematically conducted.

Organizations there are, good or necessary, bad or unnecessary. There seems to be a preponderance of the latter. Good organizations based on a vital need and systematically run for the best interests of all are surprisingly few in number.

Comparing man to other forms of animal life, it appears that man has lost in the race for efficiency.

Take the ant, or the honey-bee, for instance—with either, there exists, we are told, the most highly organized unit in existence. There are department specialists, workers, runners, and all these thoroughly informed as to their duties—all working in perfect harmony.

Truly a more careful study of the efficiency of nature would work wonders in the realm of man's self-made organizations.

Surely the superior being—Man—will not be content to be less efficient than the ant.

If we are to prosper and be happy in our social, community, state, national, and international relations—to say nothing of our business relations—then let's have Better Organization at every turn.

WHAT is to be the big plank on which hopeful politicians will rest their weight in the next elections, we do not attempt to say. We do feel, however, that the man who does not have one foot squarely on local tax reduction is not going to have the same chance to enjoy his election-return dinner as the man who faces the situation firmly and sincerely.

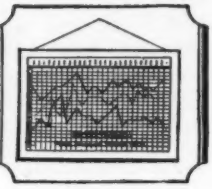
"FRENZIED STATE SPENDERS"

A great many editorials have appeared within the last few months. People throughout the country are waking up to the fact that economy begins at home. In our desire to keep the problem alive and before our readers, we quote a good editorial which appeared in a recent issue of the New York *Herald:*

> "The country is looking ahead eagerly to another reduction next winter of Federal taxes. Unfortunately there is no prospect of a similar reduction in state taxes.
>
> "The Federal Department of Commerce has just issued an abstract of state expenditures and receipts for the calendar year ended December 31, 1926, or for the latest fiscal year ending prior thereto—in most cases, June 30, 1926. This shows that the forty-eight states spent $1,614,537,954. In 1917 they spent only $517,503,220. There has been an increase of more than 200 per cent in nine years. The total for 1925 was practically the same as that for 1926. But in 1925 $51,000,000 more was paid out for state soldiers' bonuses—an exceptional obligation. There was an increase of $51,000,000 in 1926 for other purposes.
>
> "In this period of flush prosperity the states should seize the opportunity to reduce debts and lower taxation, as the Federal government has done. Most of them have not done so. Receipts in 1926 were $1,655,494,919. The total per capita collection was $14.29. In 1925 it was $13.19, and in 1917, $5.14. Receipts exceeded expenditures, and not since 1919 have the states as a whole had a surplus over all government costs, including capital outlays for permanent improvements. But excess revenue has not been generally applied in the constructive Federal manner to make sweeping cuts in taxation and debt.
>
> "Twenty-three states reduced their debts. The other twenty-five did not. The total funded and fixed debt, less sinking fund assets, mounted by $78,713,000. It is now $11.46 per capita, as compared with $11.09 in 1925 and $4.39 in 1917. Since the war the states have developed a spending mania. The splendid results of the Federal policy of retrenchment have been offset to the average citizen by the extravagances of state and local governments. One hand wastes what the other hand saves. It is a psychological and pathological problem. What can be done to restrain the enthusiastic spenders in the state capitals, who are rendering futile the relief resulting from a policy of sound and aggressive economy at Washington?"

Scientific agriculturists and extension workers can advise our farmers how to increase crops yields and how to market to advantage. They even go into rural life and work for happier homes and living conditions in the country. Let's not forget to show the farmer how to save money by sending careful spenders to represent him in his local and state governments.

# AGRICULTURAL DEVELOPMENTS



*By* P. M. FARMER

## Good From the Flood

If anything good comes out of the disastrous Mississippi flood, it will probably be the greater appreciation of the extent to which soil erosion is damaging our fundamental national resources and endangering the lives and property of large portions of the population. In recent years scientists in the Department of Agriculture and at some of the State experiment stations have been giving increased attention to this problem. At the recent International Congress of Soil Scientists, Dr. A. F. Woods, Director of Scientific Work of the Department of Agriculture said that erosion has as much to do with the constantly increasing floods as all other factors combined. This problem of controlling erosion of both the slow and rapid types, he said, is the most vital soil problem we have and the one on which we are doing the least work.

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## Darkness Suits Calves

Sunlight is generally thought to be beneficial to most animals and it has been proved to be of value to many, including human babies. But two scientists at the Minnesota Experiment Station—T. W. Gullickson and C. H. Eckles—have found that calves did just as well in continued darkness as in light and in fact some of them did better in the darkness than those that were brought up under normal conditions. For their experiments they used four grade Holstein heifer calves and kept two of them in complete darkness, but gave them stalls large enough for plenty of exercise, and let them out in a paddock in the darkest part of the night. At the end of six months there was no difference between the calves that were in the dark, and the two that were allowed to run in the sunlight, all of them having received the same food and care otherwise. They kept these calves under the same conditions until they were about two years old and all the animals grew normally and made good gains, the two calves of the dark doing a little better than the rest.

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## Self-Feeding Not for Dairy Cow

Self-feeding has become a great factor in fattening cattle and hogs, but Dr. W. B. Nevins of the Illinois College of Agriculture finds that it doesn't work with dairy cows. He says they run up the feed cost and give no more milk. Since the eight cows used were only moderately good milkers, the investigator thinks it possible self-feeding might pay with very high producers. But the point has not been proved.

In carrying on this experiment the cows were kept in individual box stalls, each stall containing a self-feeder with several compartments. The compartments contained grains, milled by-products, hay, and corn silage. Although these cows could eat all they wanted they did not get sick through overeating as cows are supposed to do. They did eat more feed than necessary and put on additional weight. Perhaps, if they had not been accustomed gradually to this new system, they might have injured themselves as cows frequently do when through accident they are able to get all the feed they can eat. Some

cows had decided preferences for certain feeds and would eat largely of them for long periods. No two cows seemed to have the same preferences for all feeds.

## Late-cut Alfalfa Not Damaged

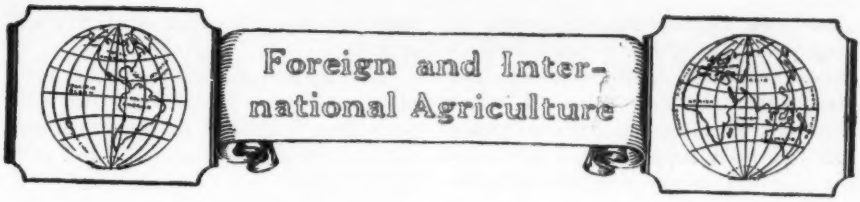
Tests made at a number of experiment stations including Kansas, Michigan, and Wisconsin, have shown that cutting alfalfa in full bloom, that is about 10 days later than the crop is often cut, gives a little greater yield, saves one cutting and one raking, and sometimes eliminates interference with other farm work. It has also been found in some cases to reduce weed and grass growth. Some agronomists say that injury results sometimes from cutting too soon or too often but not often from failure to cut the crop even for an entire season.

## Good Manager—More Money

It is a commonplace that fields on opposite sides of the fence often vary a great deal in productivity and that farms are not all alike even though the soil may have been the same. But it is not so often that we have these differences brought out so exactly and strikingly as was done recently by economists at Ohio State University. They examined the records from 400 Ohio farms. Twelve of these records were those kept by farmers of Henry county in cooperation with the county extension agent and the university. Last year the average labor income of the 12 farms was $1,861. But the income ranged from $794 to $3,368, above expenses and 4 per cent interest on the investment. The conditions were similar on all 12 farms which averaged 148 acres and a capital investment of $24,728 each. The 5 farms with highest income had about the same acreage as the 5 low farms but the 5 at the top had 87 per cent of the land in crops compared to 73 per cent on the low farms. Cash receipts were $400 higher on the 5 top farms and the labor income was $1,000 higher. On the high farms oats averaged 11 bushels higher per acre, wheat nearly 6 bushels higher, and hay a quarter of a pound more. The 5 most profitable farms handled 14 crop acres more per man than the low group. On the high farms the return per dollar's worth of feed fed to livestock was $2.16 while on the low farms it was only $1.72. The difference of 44 cents in the return on feed fed on the high farms made a difference of $500 in the earnings. Summing up the factors that make for the higher income, the economist mentions better crop yields, larger acreage of better paying crops, higher return from feed fed to livestock, and possibly better time and method of marketing. The result is the profit of $25.10 per acre instead of $16.90 which were the average returns on the two groups of farms.

## Roadside Returns

From now on during the summer and fall is the season of big business for roadside markets. Dr. U. P. Hedrick of the New York State Agricultural Experiment Station has called attention to some of the factors in the success of this method of marketing. He says that these roadside stands should be a source of steady income to fruit growers but that the low overhead will not automatically bring profits unless attention is given to such details as attractiveness of the stand and unfailing courtesy to the public. In addition to eliminating the middleman, this method, says the New York horticulturist, has the advantage that all sales are for cash. He also brings out that it is possible to dispose of a much greater variety of products than is possible when shipments are made to distant markets. He recommends that fruit growers produce a much greater variety for this sort of trade and not only more varieties of certain kinds but more kinds.




# *The* Potash *Industry*

## A discussion of recent developments by the Manager of the Scientific Research Department of the German Potash Syndicate, during his recent visit to this country.

*By* Prof. Dr. OSKAR ECKSTEIN

POTASH salts are not simply products of the mines but manufactured products which have undergone a series of processes of purification before they are obtained in a marketable form. The cost of potash salts is dependent not only on the cost of mining but on the cost of labor and material needed in manufacturing. Hence the cost of potash would have been bound to rise proportionately and parallelly with the rise of the cost of other manufactured products, if it had not been possible to counteract this rising tendency by a very far-going process of rationalization in mining, manufacture, and marketing.

This process of rationalization, which started many years ago with a systematic concentration of potash production to those mines which could be most economically worked and with discontinuing exploitation of potash deposits in Europe showing less favorable possibilities for economic working, has been extended to every other step in the manufacture and distribution of potash.

One such step was the application of the last results of physical and chemical research to the manufacturing process of the potash salts which have brought these processes to an economic and scientfiic perfection perhaps unequalled in any other branch of chemical manufacture.

The handling of potash salts has been rationalized and thus made cheaper by the erection of very extensive warehouses and terminals for potash in European harbors, particularly in Hamburg, Antwerp, and Bremen which made possible the equalization of production of potash at the mines throughout the year and the taking advantage of every facility for transportation. Thus, seasonal fluctuations in demand for potash have ceased to be as important a factor in the price fixation of potash as they used to be and the bulk of some ten millions of tons of potash salts handled annually is moved with greater facility and regularity.

ANOTHER step in the rationalization of the potash industry has been encouraging the consumer in Europe to use those grades of potash fertilizer which are less fit for exportation, and reserving for export a larger proportion of high grade potash salts, the price of which is not increased as much per unit $K_2O$ through the cost of transportation.

But all these measures would have been insufficient to enable the Ger-

man and French manufacturers to keep potash at as low a price level as exists today—a level which is not above the pre-war price—if these methods of technical rationalization had not been supplemented by a rationalization in the methods of marketing and publicity.

Up to less than half a year ago, a vast duplication in costly effort was made in potash industry through separate marketing of the products of the German and French mines. Expensive separate organizations were kept up by the two industries in the United States as well as in all other countries to which potash was exported. That such a method of marketing was wasteful and would have meant in the end increased prices to every consumer is evident. Long ago this fact was patent to both the German and French manufacturers, but it took years of patient negotiation—which sometimes were particularly difficult owing to the fact that Germany and France had just emerged from one of the most bitter conflicts in history—before a working basis of agreement was brought about which made possible the creation of common selling organizations for German and French potash in different parts of the world.

THIS agreement is the logical outcome of the tendency towards rationalization of industries which in Europe is dictated by sheer necessity because industries could not afford any longer to keep up separate organizations for selling and marketing whenever there existed a possibility of more economic system of common handling. Incidentally, the German-French Potash agreement, having been concluded between nations which were the bitterest enemies in the World War, signifies a step forward towards world peace, a step which certainly will be welcomed by everybody who believes that continuation of strife between European nations is disastrous for the progress of civilization of the white race.

The agreement between the German and French potash industries rests on a firm basis and it will work out for the benefit of consumers and producers alike.

As far as the United States are concerned, one of the most important features in the European German-French agreement has been the substitution of a greater common agricultural and scientific bureau for potash, for the separate bureaus for German and French potash existing heretofore. The new bureau will have the task to help spread, in cooperation with the agricultural stations of the United States Government, the State universities and county agents, knowledge of the right use of balanced fertilizers. One of its tasks will be systematic investigation of the pathological symptoms of potash starvation in agricultural crops.

This work will be undertaken on a far larger scale than was the case heretofore and will be directed by the scientific directors of the two former potash organizations. The bureau counts upon the friendly and active cooperation of the fertilizer industry with which it has a common interest, to supplant all haphazard use of varying quantities and formulas of fertilizers with fertilization based on actual crops needs as ascertained by scientific methods.

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## Frozen Potash

MANY analyses show that the supply of potash in the soil is ample, but analyses do not tell the whole story. Let us remember that during the last few years some banks closed their doors because of "frozen assets." Potash in the soil may be frozen just as tight; that is, the chemist may find it there, but it is not available for the use of crops.—*The California Cultivator.*

# PIMA, *the Prodigal*

*By* L. R. ENDER

U. S. Department of Agriculture

INTERNATIONAL exchange of valuable varieties of plants is now active in every part of the world. It would be a remarkable result of this exchange if Pima cotton, developed by the United States Department of Agriculture in Arizona from an introduction of seed of Egyptian cotton from the land of the Nile, should eventually become an important agricultural product in the home of its ancestors.

Seasonal conditions in 1926 were very favorable for Pima cotton in Arizona. The average yield of 329 pounds of lint per acre was the highest recorded in the 10 years of commercial production, the next highest yield having been 303 pounds, in 1923. There were 24,500 acres planted in 1926, which was about 35 per cent less than that in the preceding year, when 38,000 acres were grown. But, owing to the much higher yield per acre in 1926, the total production of 16,133 bales was only 17 per cent less than in 1925 when 19,471 bales were produced. The 1926 crop of Pima was marketed at an average price of 31 cents per pound, f.o.b. Phoenix, which was considerably more than double the average price of Upland. This fact, together with the excellent yields obtained, has revived the interest of Arizona cotton growers in this variety.

The Pima variety belongs to the Egyptian type. It was developed by selection of a superior individual plant found in a field of the Yuma variety, which itself had resulted from selection in a stock originally introduced by the United States Department of Agriculture from Egypt.

Several years ago the Royal Society of Agriculture of Egypt obtained Pima seed from Arizona, and from this stock Dr. Victor M. Mosseri, technical adviser of the society, has developed, by selection, a strain to which he has given the name Maarad. In a paper read before the Congress of the International Federation of Master Cotton Spinners and Manufacturers at Cairo last January, Doctor Mosseri described the results obtained with Maarad cotton in comparison with Sakel, which is the most valuable of the varieties now grown in Egypt and is the most important, commercially, of the extra-long-staple cottons of the world.

THE following statements are translated from the French of Doctor Mosseri's paper:

"The new Maarad cotton has so far given, in the field, a yield appreciably higher than that of Sakel, except in 1924 when the conditions were unfavorable for it, and when, nevertheless, its yield was equal to that of Sakel. In 1921, 1922, and 1923 it produced from 20 to 40 per cent more per acre than Sakel, and, moreover, had the advantage over the latter of giving a higher lint percentage, of being several days earlier in maturing, and being appreciably less wasty. . . . As to the commercial value, it may be said that America and France regard this new cotton as equal, if not superior, to Sakel. In England, although opinions do not agree on all points, the spinners consulted have declared them-

selves ready to adopt it, provided that the price is not higher than that of Sakel. The higher yield in the field and at the gin will make it possible to satisfy this condition. The Royal Society of Agriculture proposes, furthermore, now that Maarad is sufficiently well known to take the necessary measures for propagating pure lines with continuous renewal of the seed."

A somewhat similar recognition of Pima cotton was published in April by Dr. L. Trabut, of Algeria. Part of his report is translated as follows:

"In the domain of l'Habra the Botanical Service has pursued since 1896 the experimental culture of Egyptian cottons. In 1916 this Service received from Mr. Kearney, of the Department of Agriculture at Washington, his first selections in the Mit Afifi of Egypt cultivated in Arizona. Two varieties sent have become the Yuma and the Pima. From the outset these cottons showed themselves superior to the mixture derived from the first introductions from Egypt. In Algeria, also, Pima has become acclimatized since 1916 and has given, as in Egypt, well adapted forms. We will, however, keep for them the name Pima, followed by a number indicating the particular selection. At present, Pima 1423 would seem to have as much merit for Algeria as Maarad for Egypt."

# *A Floating Fertilizer Factory*

DEVELOPMENT of an innovation in fishing equipment in the shape of a vessel which manufactures fish products at sea, is described by Lewis Redcliffe, Deputy Commissioner of Fisheries in the U. S. Department of Commerce, in *The Science News Letter*, issue of March 26, 1927. One of the purposes of the factory is the conversion of fish and fish waste into fertilizer. An extract from Mr. Redcliffe's article follows:

"The most novel development in floating fish factories is that of the 'Calgary,' a French vessel of over 2,600 tons. This vessel is being provided with powerful refrigeration equipment and three large cold storage compartments with a capacity of 800 tons of fish. There are six retorts on board. One will be used for cooking lobsters and crayfish; another for making gelatin; two, capable of handling 40 tons of fish and fish waste per 24 hours for conversion into oil and fertilizer; and two others with a capacity of five tons each for the steam extraction of oil from the livers of sharks and rays. There are two oil storage tanks, one of 26,000 gallon capacity for storing fish oil and one of nearly 400 gallons for liver oil. Although it is proposed to operate the vessel off the west coast of Africa it has been suggested that the vessel may visit Iceland, Greenland, and even North Atlantic fishing banks adjacent to our own coasts."

## Beaver Appetite

THE beaver has long been known for his strong teeth and his engineering feats but little was known regarding his capacity for food. Recently a town in the Northwest hired a man to haul green aspen to the lake in front of the post-office where the city kept two to five of these animals. During the fall these beavers carried 800 pounds of wood into the lake in a single night. It was found that 2,000 pounds of green aspen was about right to supply the year's diet for one beaver, but this is thought to be more than he would eat if he were living in the wilds and had to go and get it.

# REVIEWS

**This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Soils, Fertilizers, Economics, Crops, Crop Diseases, and Insects. A file of this department of BETTER CROPS WITH PLANT FOOD would provide a complete index covering all publications from these sources on the particular subjects named.**

## Fertilizers

The Oregon Agricultural Experiment Station, in its circular 78, "Commercial Fertilizers," has published in thoroughly understandable form information for the purchase of soil fertility builders. The pamphlet which is well written by R. H. Robinson is primarily advice to farmers on such matters as the Oregon fertilizer control law, trade terms, the manner in which plant foods are combined in commercial fertilizers, high grade fertilizers, and the commercial value of the various brands produced by manufacturers.

*"Effect of Certain Nutrient Conditions on Activity of Oxidase and Catalase," Agricultural Experiment Station, East Lansing, Mich., Tech. Bul. 78, May 1927, Boyce D. Ezell and John W. Crist.*

*"Fertilizer Statistics for Texas," Agricultural Experiment Station, College Station, Texas, Bul. 350, Apr. 1927, G. S. Fraps.*

## Crops

In addition to the fertilizer bulletins mentioned in the section above, more interesting information on the use of commercial fertilizers is found in Press Bul. 396 of the Florida Experiment Station on blackberries and dewberries. The author of this bulletin, Harold Mowry, states that while "no comprehensive fertilizer experiments have been carried out under Florida conditions for blackberries and dewberries, commercial fertilizers of widely varying formulae are being used. One analyzing 4 or 5 per cent ammonia, 6 to 8 per cent phosphoric acid, and 5 to 8 per cent potash, with ammonia and phosphoric acid content derived from both organic and inorganic sources applied in early spring at the rate of 500 to 1,000 pounds per acre should give satisfactory results."

New England is especially interested in improving its hay and pasture crops.

The Thirty-ninth Annual Report of the Director Burt L. Hartwell of the Rhode Island Agricultural Experiment Station includes an excellent discussion on the efficiency of fertilizers and manures. Among the results which will undoubtedly be incorporated upon many farms are those from the top-dressing experiments. The fertilizer top-dressing which was most economical was equivalent to a half ton of a 4-6-8 ratio and reduction in the amount of any of the three ingredients resulted in a decreased yield. A reduction of potash also seriously decreased the proportion of clover.

Other crop bulletins of the month include:

*"Essentials to Successful Fruit Culture in Arizona," Agr. Exp. Sta., Tucson, Ariz., Bul. 117, Nov. 1, 1926, F. J. Crider.*

*"Pruning deciduous Fruit Trees in the Southwest," Agr. Exp. Sta., Tucson, Ariz., Bul. 118, Dec. 1, 1926, F. J. Crider.*

*"Propagation of Date Palms from Offshoots," Agr. Exp. Sta., Tucson, Ariz., Bul. 119, Dec. 15, 1926, D. W. Albert.*

*"Apple Growing in California," Agr. Exp. Sta., Berkeley, Cal., Bul. 425, May 1927, F. W Allen.*

*"Asparagus as a Truck Crop in Florida," Agr. Exp. Sta., Gainesville, Fla., Press Bul. 397, May 1927, M. R. Ensign.*

*"Ten Year Program," Ext. Ser., Amherst, Mass., Ext. Leaflet 114, May 1927, R. A. Vanmeter.*

*"Field Experiments with Seed Corn Treatments and Crop Stimulants," Exp. Sta., Lincoln, Neb., Bul. 218, May 1927, T. A. Kiesselbach.*

*"Pasture Studies," Agr. Exp. Sta., Ithaca,*

*N. Y. Memoir 104, Nov. 1926, R. G. Wiggans.*

*"Twelfth Annual Report," Agr. Ext. Ser., Raleigh, N. C.*

*"The Bimonthly Bulletin," Agr. Exp. Sta., Wooster, Ohio, Vol. XII, No. 3, May-June 1927, Whole No. 126.*

*Department of Agriculture and Immigration of Virginia, Richmond, Va., Bul. 234, June 1927.*

*American Potato Journal, Washington, D. C., Vol. IV, No. 5, May 1927.*

*"Farm and Factory must Prosper Together," Col. of Agr., Madison, Wis., Cir. 211, Mch. 1927, K. L. Hatch and H. L. Russell.*

*"Pastures for Pigs," Col. of Agr., Madison, Wis., Cir. 213, Apr. 1927, F. B. Morrison, J. M. Fargo, and H. J. Brant.*

## Economics

"Farm Taxes and Assessments in Massachusetts," Bul. 235 of the Massachusetts Experiment Station treats well this ever important worry of the farmer. The bulletin concerns itself primarily with the question of an equable distribution of the tax burden.

*"Cost of Producing Almonds in California," Agr. Exp. Sta., Berkeley, Cal., Bul. 422, Apr. 1927, R. L. Adams.*

*"Virginia Farm Statistics 1926," Div. of Agr. Statistics, Virginia Dept. of Agr., Richmond, Va., Bul. 4, Apr. 1927, Henry M. Taylor.*

## Diseases

*"Grapes," Mass. Agricultural College, Amherst, Mass., Ext. Leaflet 100A, Rev. Apr. 1927, Brooks D. Drain and O. C. Roberts.*

*"Peaches," 100B,*

*"Sour Cherries," 100C,*

*"Apples," 100D,*

*"Plums," 100E,*

*"Pears," 100F.*

*"Classification of Plant Viruses," Agr. Exp. Sta., Madison, Wis., Res. Bul. 76, Feb. 1927, James Johnson.*

*"Effect of Spraying with Fungicides on the Keeping Quality of Florida Citrus Fruits," U. S. D. A., Washington, D. C., Dept. Cir. 409, Apr. 1927, Harry R. Fulton and John J. Bowman.*

## Insects

*"The Pine Tipmoth in the Nebraska National Forest," Agr. Exp. Sta., Lincoln, Neb., Res. Bul. 40, Apr. 1927, M. H. Swenk.*

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**Early to table and late to arise makes a man "hefty" and hastens demise.—*Farm Club News.***

# Yancey Swanson

(*From Page 23*)

came back on May 28 with no plants.

"Dad suggested that I plant the land in cotton but we all agreed that there was a mighty slim chance for a crop. I planted cotton in early June on poor, white sandy land. It grew a little over knee high but it was surely loaded down. I got two bales at one picking, and I made about three bales in all from the two acres."

"Wait a minute," I said, "surely you didn't use 300 pounds of muriate of potash on one acre of cotton. That gave you about 17 per cent potash in the mixture, besides the potash in the cottonseed meal."

"I never had stopped to figure it all out," Harry replied. "I know I used a lot of potash and I made a lot of cotton, where I didn't expect to make more than one-third of a crop."

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# Idaho

(*From Page 26*)

seed laboratories. Seed establishments located in approximately 27 counties are visited by inspectors each spring for the purpose of checking seed lots held for sale.

All dealers and farmers selling clover and alfalfa seed for seeding purposes are required to have the seeds graded to meet the Idaho seed law requirements. The State has an enviable reputation as a producer of good seed, and the seed laboratories maintained by the experiment station have widely recognized records for accuracy of analyses and for helpful service to seed growers and to the seed trade.

That the experiment station has proven its worth is shown in a constantly growing indication of greater dependence upon both the experiment station and the extension service and a more widespread appreciation of the economic importance of the statewide work of these two publicly supported educational agencies.

# CORN SUCKERING

## *Removing suckers reduces food manufacturing capacity of the plant*

*By* A. A. BURGER
Cedar Falls, Iowa

IN a great many of the corn yield contests some of the contestants have followed the plan of suckering the corn in the hope that they might thereby increase the yield. Even in the production of sweet corn it is a quite common practice, especially where the fields are rather small. County agents, Smith-Hughes instructors, and extension field men know that there is a common opinion that suckering the corn increases the yield, produces more uniformly large ears, and hastens maturity.

*Chas. P. Bley standing in acre of contest corn yielding 86 bushels. Suckering here, induced firing and reduced the yield*

Will suckering corn bring about any of these results? And if it does, will it pay? Evidently there still must be some difference of opinion for the practice still exists.

It was during the early part of the summer of 1926 that I observed a very fine field of Golden Bantam sweet corn, the property of Geo. W. Hughes of Cedar Falls, Iowa, that had been carefully suckered after the suckers made their appearance. I determined to watch the result. Those who live in the corn belt states will recall that we had a hot, dry summer. What happened? When the corn was well in tassel and about the time that the ears were beginning to shoot, it was noticed that the lower leaves of some of the stalks were beginning to fire, or dry up. Soon thereafter the forming ears ceased growth.

I asked Mr. Hughes what he thought about the practice, and he replied that he had a second field of corn, about the same size as the first, from which he did not remove the suckers. "While from the suckered patch I secured nothing," he said, "from the second I sold $125 worth of corn."

In the acre corn yield contest that was conducted in Black Hawk county, Iowa, in 1914, and in which there were 571 separate acre entries, some of the suckered fields produced disappointing results. One of the outstanding fields of corn in the contest, that of Chas. P. Bley—corn that stood over 12 feet high with a perfect stand of three per hill,—produced but 86 bushels per acre. It fired after the suckers were removed.

THE same result was produced on an acre entry of A. G. Larson. The acre of carefully treated suckered corn was abandoned to an adjoining acre not suckered and which produced a higher yield. This land had been treated in the spring with an application of acid phosphate and potash. The yield of the unsuckered acre was

94.7 bushels air dry corn on the acre basis. Little was known, at that time, of the effect of removing suckers, but it was apparent that the fertilizer had produced some very appreciable results,—enough, at least, so that this acre was ranking second and bidding hard for first honors in the largest acre yield contest ever conducted in any county prior to that time, and possibly since.

But such isolated, incomplete tests as these are not sufficient on which to base reliable conclusions as to the result of suckering.

In 1922 the Nassau County, New York, Farm Bureau made five cooperative tests with sweet corn, — Long Island Beauty and Kromer's Special White—four of which showed in favor of suckering and the fifth against. All were made the same year and were run in duplicate only. These results, therefore, are not clearly significant.

The same year Hepler gave the results of an experiment at the New Hampshire station with two varieties, Early Crosby and Golden Bantam, four rows of each variety, 250 feet long. With Early Crosby the unsuckered rows produced 5.8 per cent larger yield but the suckered rows averaged one-third of an ounce heavier yield. Suckering with Golden Bantam increased the yield of 2.6 per cent but made no difference in the size of the ears.

DeBaum (1916) reported the result of three cooperative tests in Bergen county, New Jersey, conducted in 1915, in which 10 rows of 10 hills each were selected. Duplicate tests were made. Average yields of dry corn per row were as follows: (1) check, not suckered, 17.1 pounds; (2) suckered when plants were one foot high, 14.2 pounds; (3) same as (2) with second suckering later, 13.5 pounds; (4) suckered when plants were two feet high, 13.8 pounds; and (5) suckered when tassels began to show, 12.4 pounds.

Commenting on these results he said: "During favorable growing seasons the yield of sweet corn is reduced in proportion to the lateness of suckering. Corn not suckered gives the heaviest yield. Sweet corn suckered early in its growth will be ready for market two to four days earlier than that suckered late or not at all."

BUT what will be the effect on field corn? The results here are much more conclusive. Montgomery (1916) summarized the results obtained with field corn in experiments conducted at the Nebraska Station covering a period of five years. In every case the yield was reduced by removing the suckers, (tillers).

Lyon (1905-23) reported two years' results of removing suckers from field corn in the same State which also showed a marked decrease in the yield due to suckering. The yields were 64 bushels against 81 bushels, a difference of 17 bushels, or more than 25 per cent, in favor of the unsuckered corn.

Ricks (1915) gave the results of experiments carried on with field corn in Mississippi for two years. Corn suckered when four feet high averaged 34 bushels per acre; and when six feet high, 33 bushels; unsuckered corn averaged 39.2 bushels per acre.

But the most complete results which have been reported were those published in 1926 by H. C. Thompson of Ithaca, New York, with Stowell's Evergreen and Golden Bantam sweet corn covering a period of five years' work. The soil was of moderate fertility. Rye was plowed under and manure added at the rate of 15 tons per acre—both treatments each year with the exception of the first. Fertilizer applications consisted of 800 pounds of approximately a 2-8-4 in 1920 and 1921, and a 4-8-4 mixture in the other years, broadcast in the spring after the land was plowed. The mixture consisted of nitrate of soda, tankage, acid phos-

(*Turn to Page* 53)

# Soybeans

*¶Here's more valuable information on the legume discussed last month*

*By* G. P. WALKER

Soil Specialist, Purdue University

SOYBEANS, a comparatively new crop in the Middle West, have assumed a definite and important place in the agriculture of this region. Heralded by enthusiasts as the logical crop to supplant oats in corn belt rotations and lauded by livestock men as a valuable home grown protein supplement, this crop has enjoyed a healthy growth in popularity in spite of two rather serious handicaps, namely the labor competition with corn and the difficulty of getting the seed crop threshed in communities where it is not yet widely grown.

The acreage in Indiana, which may be taken as typical of the corn belt states, has increased from less than 5,000 in 1920 to over 350,000 in 1926. This includes both the hay and grain acreage. According to county agent reports an additional 100,000 acres were grown in corn during the past year.

A few years ago the idea was rather general that the oil mill would soon be receiving the bulk of the soybean crop and high oil content was considered an important item. Very few mills are in operation at the present time simply because they cannot get enough beans to operate at the price they can afford to pay. Out of the 200,000 acres grown in Indiana for seed but a few hundred bushels actually go to the mills.

OUTSIDE of the seed requirements for producing new seed the great bulk of the grain crop is fed to livestock directly, seeded to produce legume hay, and planted with corn for pasturing off or as a soil improvement crop. The discovery of the value of cheap minerals in supplementing soybean rations

has been a great boon to the hog man and has greatly increased the use of beans for this purpose.

However, this method of feeding is not fool proof and threats of dire consequences to regions producing too much soft pork are being heard. Soft pork is the oily flabby type produced by rations too rich in beans of high oil content. The livestock men are now wanting low oil, high protein beans for direct feeding to hogs and other livestock.

Perhaps too much has been expected of the soybean from the fertility standpoint because it is a legume. Complaints of low yields of other crops following beans are rather frequent. A typical case is the experience of one farmer in the prairie section of Illinois. Soybeans for three consecutive years on one field of this fertile prairie soil produced yields of 19, 24, and 30 bushels respectively. He sold them at an average price of two dollars per bushel or a total average return per acre of $50 for each crop. The next year he put this field in corn. Imagine his disappointment in husking a very poor crop of 30 bushels per acre—by far the worst corn on the place. Now he has no use for soybeans.

The three soybean crops took from the soil about 75 pounds of available phosphoric acid and 150 pounds of potash per acre—more than twice as much potash and almost one-fourth more phosphoric acid than three 50-bushel crops of ear corn would have taken. Soybeans and corn are both rather shallow rooted crops and compete with each other for the available mineral plant food in the surface soil. Only a limited amount of the minerals become soluble so plants can use them each year, and when this supply gets too low, as the result of heavy feeding grain crops for several years in succession, the crops following are bound to suffer.

This man would not have been disappointed with a poor fourth corn crop if he had planted corn on that same field for four straight years; in fact, he would have expected it. Had it averaged 50 bushels per acre the corn would have given a yearly return of about $25, just about one-half the returns realized from the soybeans.

Five dollars worth of a phosphate and potash fertilizer and the return to the land of the soybean straw would have put back into the soil a large share of the available mineral plant food removed and left it in far better condition for succeeding crops. In field experiments at the Indiana Experiment Station, wheat after soybeans has averaged for 10 years seven bushels more per acre than wheat after corn with similar fertilization.

## Disease Control

THE effect of potash in increasing the disease resistance of potatoes is strikingly illustrated by figures obtained last year at the Kirton agricultural institute's experimental farm in England. In one series of plots the percentage of healthy plants rose from 42.7 where no potash was applied, to 51.1 where two hundredweights per acre of sulfate of potash were used. The duplicate series showed an even more marked difference, the health percentage rising from 28.5 to 58.8. The lower grade potash salts were found to be much less efficient in this respect than the sulfate or muriate. "It is necessary to emphasize the fact," said the experimenters in their report, "that potash is the determining factor in promoting the disease resistance of plants, in so far as this resistance can be affected by manuring. Nitrogen and phosphates, the former in particular, are liable to exercise an adverse effect when used in excessive amounts. These facts must be kept in view when drawing up any scheme of manuring, or devising formulas for compound manures.—*The California Cultivator.*

# Corn—Peaches—Cotton

*Interesting items picked up here and there*

W. S. HUNT, of Moultrie, Georgia, produced 717 bushels of corn on five acres last year, or 143.4 bushels per acre, and won first prize in the state five-acre corn contest.

In addition to eight two-horse loads of lot manure per acre, Mr. Hunt used 400 pounds of kainit, 400 pounds of acid phosphate, 200 pounds of nitrate of soda, and 200 pounds of 9-3-5. Part of the fertilizer was broadcast and part applied in the row.

Taking all the fertilizers together, Mr. Hunt used the equivalent of 1,200 pounds of a 7-3-5 per acre, worth about $18. This seems an exceptionally large amount of fertilizer to apply to one acre of corn but the fact remains that his gross returns per acre were $143.40, and therefore, this amount of fertilizer paid big dividends. The average corn yield for Georgia was 14.5 bushels per acre.

Corn is essentially a starch plant and potash plays a big part in the formation of starch in all plants. Potash produces a sturdy plant that stands up well against windstorms. In dry weather plants receiving plenty of potash remain green for a longer period of time than those receiving small amounts of potash. Potash thus increases yields by permitting the plant to perform its normal functions. Potash gives large, plump grains and ears that fill well toward the tip.

W. H. Robitzch, a club boy of Fitzgerald, Georgia, under the direction of County Agent C. T. Owens, conducted a two-acre potash test with corn in 1926. Each acre received two tons of lot manure and 400 pounds of a 9-3-3 fertilizer. To one acre he applied 100 pounds of muriate of potash as a side-dressing at the second plowing. The high-potash acre produced 82 bushels of corn and the other acre 67 bushels.

The side-dressing of 100 pounds of muriate of potash, worth $2.30, gave an increase of 15 bushels of corn.

Recent tests in Indiana, Rhode Island and other states, show that corn requires relatively large amounts of potash for maximum production.

* * *

R. H. HOLMES, a large peach grower of Culloden, Georgia, reported that peaches on a Cecil clay loam failed to color properly in 1925. The following year he applied about three times as much potash as formerly, and the fruit was perfectly colored.

John Woolfork, of Fort Valley, Georgia, bought an orchard several years ago on which the fruit was always poor in color and quality, and did not ship well. He increased the amount of potash in his fertilizer for this orchard and has never failed to get excellent quality fruit.

* * *

"IN spite of the fact that Montgomery County, Texas, farmers will cut down their cotton acreage by planting more corn and feed crops, twenty-five per cent more fertilizer will be used this year than last," asserts J. F. Combs. This is due to the cotton contest last year, he thinks. It was clearly demonstrated that better methods of fertilizing and cultivating pay. Those making a bale or more to the acre, tell him that they are not disturbed about the low price paid for cotton.

# The Uses of Corn

(*From Page* 12)

marshmallows, and bonbons. The cook thickens her puddings, sauces, pies, and custards with cornstarch. Then cornstarch serves as a filler, finishing or sizing material for paper, fabrics, cosmetics, and pastes. It also finds application in the manufacture of a high explosive, and large quantities are used for making baking powder.

Dextrines are made by roasting the starch, the various varieties depending upon the time and heat applied. Dextrines are used in the textile industry in sizes for strengthening the fabric and finishing the product. They enter into the manufacture of color for printing calico, into gums, glue, inks, mucilages, in polising rice and coffee, and in fireworks called sparklers.

In addition to cornstarch and corn oil large quantities of corn sirup are manufactured each year. The sirup enters into the manufacture of candy, it is used in making jams, jelly, ice cream, and for mixing with cane sirup and molasses in the preparation of mixed sirups. It enters also into the manufacture of shoe polish and in silvering glass for mirrors. It even has a place in tanning.

NOW add to these products mentioned perhaps 100 more which may be derived from the kernel and we have hardly made an impression on the enormous corn crop which is produced in the United States each year. The Government has estimated that about one bushel in every fifty is used in the manufacture of starch and glucose and about three per cent of the crop is ground into corn-meal. One naturally asks, "What then happens to the bulk of the crop?"

Although corn marketings comprise but a small proportion of the entire crop, the amount of corn raised is so very large, varying roughly from 2,300,000,000 bushels to 3,000,000,000 bushels each year, that the supply available for manufacturing purposes is always a large one. The hog is the largest consumer of corn; about 40 per cent of the entire crop is fed on the farm to these animals. The corn thus fed is marketed to the American people in the form of pork and lard. About 45 per cent of the crop is consumed by cattle, mules, poultry, and other animals. Only a small proportion is exported; the past two years there has been less than one per cent of the crop to leave our shores each year.

Corn is the greatest American cereal. The production of corn in 1925 was over a million bushels more than the combined production of wheat, rye, barley, oats, flaxseed, rice, buckwheat, and sorghums. Little wonder that corn is called a king of plants. Mr. E. V. Wilcox published an article several years ago on corn products in which he wrote:

"Corn gives us pork, mutton, fried chicken, eggs, milk, butter, cheese, Johnny-cake, hominy, flapjacks, hasty pudding, hot tamales, corn pone, and scores of other good things to eat. We have found that corn sweetens our candy and cakes, yields shortening for our bread and biscuits, gives filling for our pies and puddings, stiffens our collars, stains and varnishes our wood furnishings, helps to make ink and paper, sticks the stamps on our letters, holds briquettes together, sputters in fireworks, booms in explosives, dyes our calico, protects our battleships, softens our face powder, stops up bottles, rubs out our mistakes with art gum, and gives us salad oils, soaps, mattresses, pipes, and music disks.

"Thus the corn plant feeds us, sings to us, washes us clean, hands us a pipe of peace, gives us abounding energy, and at the close of day provides us with a bed."

## Corn Suckering

(*From page* 48)

phate, and muriate of potash. Bantam planted 2 x 2 feet, and Evergreen 3 x 3, both thinned to three stalks per hill. Six replications, or seven rows, treated as follows:

A. Check, suckers allowed to grow.

B. Suckers removed once when plants were 12 to 18 inches high.

C. Same as B. but suckers removed as they appeared later.

D. Suckers removed when plants began to tassel.

WITHOUT details, here is the conclusion:

The writer is of the opinion that under most conditions the practice of suckering is not justified and is more likely to result in loss than in gain. The later the suckering, the greater is the chance for loss. He observed that there was no increase in: the total yield of marketable ears; the yield of grade 1 ears; earliness; and size of ears; and, further, that suckering decreased the amount of forage materially, and materially increased the cost per acre. At 40 cents per hour, the cost of one suckering is figured at $3 per acre; twice, at $4.50; and three times, not less than $6.

The common opinion concerning the advantages of suckering corn is based upon the false assumption that the removal of the suckers allows the plant food to go directly to the ears. The raw materials taken into the plant from the soil do not go directly to the ears, but must first pass to the leaves and the other green parts of the stalk where they may be acted upon by the sunlight, digested, as it were, before they may be transformed into the complex starches and sugars which are ready to form the fruit, or the grain of the plant.

Suckers are a part of the leaf surface of the plant. Removing them reduces the food manufacturing capacity of the plant. They seem to act in much the same way as the leaves of the parent stalk itself.

All of us have noticed the effect of the removal by hail of the leaves of a field of corn before it was fully mature. Under some conditions the removal of some of the foliage through the removal of the suckers might prove advantageous, but just when that should be done it is difficult to tell in advance. At any rate, the evidence so far is wholly against the practice, especially so when the cost of the operation is taken into consideration. More often we may expect a loss.

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## Hay

(*From Page* 20)

*tilizer* treatment.

Some of the yields obtained are recorded below:

*Yield of hay at Rothamsted—Average of 57 years*

| *Plot No.* | *Treatment* | *Yield as pounds* |
|---|---|---|
| 13 | Unmanured | 2,090 |
| 17 | Nitrate of soda | 3,370 |
| 7 | Complete mineral manure | 4,090 |
| 14 | Complete mineral manure and nitrate of soda | 5,690 |
| 11-2 | Complete mineral manure and ammonium salts | 7,330 |

These results show the marked effect of soil treatment in increasing the yield of hay. This is not the whole story. The method of fertilizing greatly influences the character of the herbage. The unmanured portion had an excessive proportion of weeds of low nutritive value. Of late years the weeds on the untreated soil amounted to as much as 50 per cent.

The use of nitrogenous fertilizer alone without potash and phosphates has had a decided influence on the character of the herbage. The large amounts of nitrogen have so stimulated the growth of the grasses that both weeds and legumes have been largely crowded out. Where nitrogen has been used freely, the weeds were

barely perceptible in some plots to a trifle over 4 per cent in others.

Where ammonium salts as a source of nitrogen were used, the dominant grasses are False Oat Grass, Bent Grass, Sweet Vernal, and Sheep Fiscue. Meadow Foxtail, Cocksfoot, Yorkshire Fog, and Smooth-stalked Meadow Grass are the principal other grasses found.

Where nitrate of soda is the source of nitrogen the vegetation is more varied. Legumes are not entirely absent, Meadow Vetchling and White Clover being found.

Soil treated with mineral manures containing potash has encouraged the growth of legumes such as clovers. In the beginning the grasses constituted 80 per cent of the herbage and weeds the remainder with no perceptible amount of legumes. Where potash has been used, legumes now constitute 30 per cent of the herbage.

The results of the experimental work at Rothamsted show the marked influence of fertilizer on the growth and production of grass land. The practice of using fertilizer of some sort on meadows and pastures in England is now a very common practice and contributes in a very material way to their superior carrying capacity.

IN America, on the other hand, no systematic attempt is made to fertilize either the pasture or meadow. The pasture usually receives only the residues left over from the fertilization of the grain crops in the rotation. Some experimental work has been carried on in several states which shows the marked influence of fertilization on the production of hay and grass.

Cornell University has recently reported the results of some fertilizer tests on timothy meadows. From these records it is possible to make direct comparisons of the results of the use of fertilizers with those obtained from the same type of soil without the use of fertilizers.

Varying amounts of sodium nitrate were used in 1912, 1913, and 1914. The average amount used during the three-year period was 96 pounds per acre. Muriate of potash was used at the rate of 56 pounds per acre per year and acid phosphate at the rate of 128 pounds per acre per year.

The cost of the nitrate of soda used in the above experimental work was $2.52, the cost of the acid phosphate was $1.02, while the potash cost $1.19; or a total annual fertilizer cost of $4.73 per acre.

The average yield of hay on the unfertilized land was 2.77 tons while the fertilized section yield was 3.32 tons per acre. The fertilizer increased the yield of hay by .55 tons.

The average price of timothy hay received by the producer in New York State during the years 1921-25 was $15.48 per ton. Fertilizing the meadow at a total annual cost of $4.73 produced an increase of .55 tons of hay worth $15.48 per ton or hay having an actual value of $8.51. This amounts to a nice profit of $3.78 per acre for the use of commercial fertilizer on the meadow, and results in a material reduction in the cost of producing hay. An annual return of $3.78 on the original investment of $4.73 is 80 per cent return on the investment which is certainly very good interest. The treatment of a 200 acre meadow with fertilizer in this manner would cost the operator $946. At the end of the season he would get his money back and make a profit of $756 besides.

These yields were obtained on unusually good hay soil. The unfertilized yield was 2.77 tons. The average yield of hay in New York State for 1925 was only one ton per acre. The results for the use of fertilizer on the majority of the hay lands of the hay region in these states would probably be much better.

The carrying capacity of untreated pastures in this region is also very low. In Virginia a two and one-half acre

untreated pasture produced a gain in weight of pastured livestock of 723 pounds, while during the same period of time a similar field of fertilized pasture produced a gain of 1,350 pounds. This amounts to an increase in the carrying capacity of the pasture of 90 per cent due to the fertilizer treatment.

APPROXIMATELY 36 per cent of the farm land in the United States is devoted to crops, while 33 per cent is devoted to pasture; that is, there are 91.5 acres of pasture to every 100 acres crops. More than half of the feed consumed by livestock in the United States is produced by pasture. The cost of pasturage is only one-half as great as harvested forage. The importance of carefully considering methods of increasing the carrying capacity is quite evident.

The uniformly marked increased yields on hay and pasture having fertilizer applied either as manure or mineral fertilizer indicate the great benefit from its use and warrant the most careful consideration by the farmer.

Barnyard manure, if available, will give good results if used up to as high as 10 tons per acre. Sodium nitrate can be used with profit as a top-dressing at the rate of 100 to 200 pounds per acre, acid phosphate at the rate of 100 to 150 pounds per acre, and muriate of potash at the rate of 50 to 100 pounds per acre.

It is also more than probable that the use of limestone materials will also prove of value in many meadows and pastures. Such limestone material will have little value if simply applied as a top-dressing; it must be harrowed in for the best results. Lime controls in a large measure the nature of the herbage in meadow and pasture. The presence of lime promotes the growth of legumes, bluegrass, and timothy while its absence favors the growth of redtop, bent, quackgrass, and sorrel.

## Eighty-five Years of Fertilizer Experiments

(*From Page* 28)

markable effects. They impart vigor to the crop in adverse conditions and they improve the quality. This makes them of special value to growers of potatoes, sugar beets, good quality fruit and vegetables.

The problem of how much fertilizer a farmer should use, and when he should apply it, is being thoroughly investigated at Rothamsted. Another problem is fitting the fertilizer to the soil reaction, that is, to acid or alkaline soil.

Fertilzer problems thus have widened and link up closely with modern physiological work on plant nutrition. In the early days it was necessary to demonstrate to farmers that fertilizers would profitably increase their crops. In old, settled countries the best farmers now know this, but there is much extension work to be done for newcomers and in new countries or where the system of husbandry is changing.

PRESENT-DAY problems are concerned more with the fine adjustment of the fertilizer scheme to the farmer's conditions, making it fit his economic situation, soil moisture, soil reaction, and above all his climate, so as to avoid disappointments. The great fertilizer organizations should, before long, and when further information is avaliable, seriously study the question of insurance of crop increase where recognized fertilizer treatment is adopted.

The changes induced by fertilizers in the crop are of growing importance. Advantages may be taken of changes in habit of growth for completing the adaptation of the crop to the farm conditions, while improvements in feeding value of fodder crops and in quality of crops intended for hu-

man consumption may be of very special value. As prosperity increases and people have more leisure they acquire a greater appreciation of the meaning of quality. A population struggling for food is concerned only with quantity; as its taste becomes educated and refined, it demands quality. Scientific workers and fertilizer manufacturers are equally interested in finding solutions of these important problems.

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## The N.F.A. Convention

(*From Page* 21)

the fertilizer industry. The farmer now tends to buy goods the day he needs them. He does not store for use in advance as he used to do. This change in habit is forcing the fertilizer industry as well as other industries to adopt new methods of merchandizing. During the depressed condition of agriculture, President Carter believes, it is going to take all the intelligence possible to conduct affairs on a sound, business-like basis; and along this line he also emphasized the need for a few high type salesmen rather than many mediocre salesmen.

"Everybody who deals with the farmer is interested in seeing something done for the farmer which will give him his proper share of the national income, which he is not getting," declared Charles J. Brand, executive secretary of the association. Each of the broad divisions of the fertilizer industry and the difficulties that are to be met in each were ably discussed by the speaker. The address showed that Mr. Brand had given a great deal of thought and study to the problems of the fertilizer manufacturer.

Another speaker of the staff of the association was J. C. Pridmore, who gave a very instructive and hopeful talk on "The Fertilizer Outlook in the South." The speaker showed briefly that the aim should be for cheaper production and the production of more food crops grown at home. He emphasized that progress was being made in these two directions and as the cotton price was trending upwards, the outlook for the southeastern states, where most of the fertilizer for cotton is used, was quite hopeful.

SPECIAL thanks are to be given to the staff of the association in attendance at the convention for two things: the zeal and initiative shown in getting out a daily morning paper with associated press news items, as well as news of the day's doings at the convention, and the songs with which each morning's session was started. It is much more stimulating to spend a morning after singing such a song as *Dixie* or *America* than it is to start merely by sitting down.

John I. Tierney gave a report on the joint office with the Manufacturing Chemists' Association. Thomas W. Howard gave a very instructive address on "What Uniform Cost Accounting Has Done for Other Industries." This is a very important matter and merits the support of all the members of the association. W. B. McCloskey has been appointed cost accountant of the association. He gave a very interesting talk on "The Comparison of Cost Figures." Horace Bowker showed the necessity for soil fertility research work, and indicated the direction such work should take.

As one of the speakers pointed out, how could an individual company contend with the problems it has to meet unless such companies were banded together in an association? Such an organization is essential beyond any doubt. If it is essential it merits the support of the whole industry. Most certainly the last convention was a striking object lesson in what can be done to define mutual problems and to stimulate a courageous spirit in meeting them.

# Douglas County Oregon Pioneers with New Crops

(*From page* 18)

being one foot apart and four feet between each pair. This made it easier to cultivate them as well as to gather them. They were planted just before Thanksgiving and picking started on April 20. Most of the peas from the Umpqua valley were shipped in burlap sacks last year, but the farmers will ship them in hampers this year as that makes a much more attractive pack which naturally results in better prices.

| *Treatment* | *Yield in Crates* | *Price per Crate* | *Net Returns* | *Cost of Fertilizer* (including labor) |
|---|---|---|---|---|
| 200 lbs. sulfate of potash and 100 lbs. nitrate of soda | 144 | $4.60 | $662.40 | $20.50 |
| None | 120 | $2.50 | $300.00 | ..... |

THE Umpqua valley peas are the earliest in the country with the exception of those produced in the Imperial valley of California. Proximity to the Eugene, Seattle, Marshfield, and Portland markets should make pod pea growing a profitable side line. Another point in their favor is that one can get a second crop each year from the same land.

Cooney believes that the results of some fertilizer trials on strawberries, showing that potash hastens strawberry maturity, will change the practice of strawberry growers in the county. He said, "This fruit, while grown for a great many years in the county, has never reached the commercial scale it has in many districts, chiefly because we have had no variety that will ripen early and stand up under express shipments. Last year we secured four cooperators to make some fertilizer trials, but the most outstanding results were secured by J. A. Crawford of Myrtle Creek with an application of 200 pounds sulfate of potash and 100 pounds nitrate of soda per acre. The fertilized berries were 10 days earlier on the market and returned 100 per cent more money than the unfertilized.

The following table brings out the results. It will be seen that a $20.50 investment resulted in an increase of $362.40 in returns for this particular trial.

The berries from the fertilized plot stood shipment so much better than did those from the untreated plot that even though they had not matured at an earlier date they would have been worth more money. The increase in yield, although it was 24 quarts, was negligible in comparison with the increases of $2.10 in price for all the crates produced.

MARK N. TISDALE is one of the farmers who has profited much from his association with Cooney. He is a banker but he knows something about farming too, because he is making a 10 per cent return from pears on land that is valued at $1,500 an acre. He started out fertilizing with nitrogen in the form of sulfate of ammonia alone, but he got too much leaf growth. He is now putting a part of this element into the soil by means of cover crops and legumes. He used a carload of lime last spring to help the vetches and rye grass come along and is now causing a 6-7-8 fertilizer to supply the plant food that is taken out of the soil each year by the heavy crop of pears.

## An Orchard for Cowboys

(*From Page 9*)

"My business grew and prosperity rushed into the door on every West Texas wind that blew. Wilson began to feel proud of himself and his dear spouse who partnered with him nobly through the early lean years.

"Last year, as I was walking down the old orchard, I noted that the bark of the trees showed age, and the branches had begun to die back toward the trunk. A new acreage must be set if prosperity was to continue.

"On the upper side of the orchard where the young trees were set, the soil was depleted. The potash and lime had leached out. In the valley below, I assumed that the dirt was good enough and I let nature take care of itself. But I found that nature couldn't do what I could do for myself. The trees that were fertilized made more than three feet of growth by the first summer, but the stock that was set in the native soil didn't put out branches any longer than my hand by the middle of June.

"I AM thoroughly convinced that fertilizer is absolutely necessary in an orchard if the trees are to make a rapid growth and fruit early. I note, too, that the trees that were fed have a root system of greater spread. Since then I've read a great deal on fertilizers, and doubtless had I fertilized my old trees, their life would have been extended and the fruit would have been of a better quality. I am convinced, too, that had I made an application of potash and lime when the trees were shedding, there would have been less of the immature, wind-blown fruit. Another year I am going to fertilize those old trees that appear to be dying; from observation, I am convinced that it will invigorate them and start up new life.

"The orchardist who hasn't learned the value of fertilizer among his trees needs to be informed.

"RECENTLY a Government man was out at my house making a study of the pioneer orchard of this section of the West. I asked him what he thought of fertilizer for fruit trees. Here's what he said:

" 'Fertilizers will grow strong trees and the vigorous growth helps to repel diseases and injurious insects. Fertilizers will hasten the maturity of the fruit, make it firmer, give it a rosier color, and lessen the tendency for the fruit stem to yield to the wind. Fertilizers will increase the size of the product and in many instances double the market value of the yield. The margin between the sale of the unfertilized crop and the returns from the harvest from fertilized trees is where the profits lie.'

"If I could go over the days when I fed the cowpunchers their first West Texas fruit, I'd fertilize and today I'd own double the acreage of my present farm."

Then Mr. Wilson turned to the writer and said, "Come on, let's go eat a watermelon."

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## Wheeled Schools

(*From Page 7*)

is forgotten, and remarkable cures effected, for the time being, at least.

The advent of the Mexican boll weevil into the cotton fields of the South brought the full possibilities of the school-on-wheels idea to the attention of the U. S. Department of Agriculture. Some means had to be found for teaching every farmer in the cotton belt how to fight the in-

*A group of negro farmers learning how to dust cotton to beat the boll weevil*

sect menace. This meant reaching the negroes as well as the whites, for whether as tenants or owners, they furnish the bulk of the labor in cotton cultivation. From this came the widespread introduction of schools on wheels under the auspices of the Federal Government.

AS a nucleus, the government took over the wheeled-school equipment of the Tuskegee Institute. In cooperation with the states, it sent traveling schools into various sections of the South. The program of training was enlarged. Greater educational value was given the system by establishing headquarters at various negro schools and colleges. The plan has been highly successful.

In Alabama, where the work started, the rural life of the negro has been influenced to a marked degree. More than 2,000 individuals now receive instruction each month from the wagons. The success here has attracted visitors from many parts of the country, even from abroad, to study the methods.

Wherever possible the wagons go out with negro demonstrators. They have been found to get excellent results when working under the direction of white men and women. It was difficult at first to find good negro agents. But soon it was found that good ones could be developed from among the graduates of the negro schools, such as Hampton and Tuskegee. And it is from these that most of the people now engaged in the work come.

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## The County Cows Built

(*From Page* 15)

cellent section for dairy farming. Col. Montgomery knew this 50 years ago.

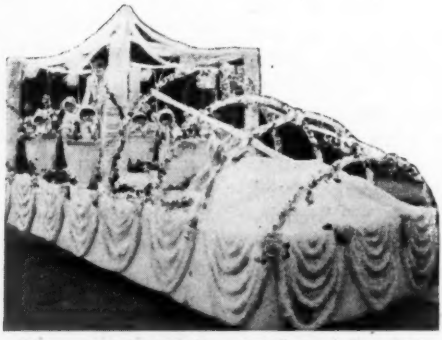
Constantly working for a progressive agriculture, he was one of the leaders in getting a state agricultural college for Mississippi in 1878. He was influential in locating the college at Starkville and was the first member of its first board of trustees, serving until his death in 1904.

Professor J. S. Moore, present head of the dairy department of the college, was graduated in 1894. As a student Professor Moore demonstrated an unusual interest in dairying and was, therefore, attracted by Col. Montgomery. They became staunch friends and largely through their efforts the college dairy department was established in 1900.

The first herd consisted of 65 grade cows, valued at $1,300. Thirty-five of these cows were sold, and one registered Jersey bull and two purebred heifers were bought with the money. With this humble start the present college herd of 250 purebreds has been built up. This herd has paid its own way without financial assistance and today is valued at more that $50,000, not considering improvements to land, buildings, and equipment.

IT is almost hard to believe that in Oktibbeha, Jersey county of the South, back in the memory of some of the older settlers, it was impossible to find a nearby market for Jersey butter because it was so yellow that the people thought it was painted. By and by it was found that the world market demanded yellow butter and that the Jersey cow could beat the chemist and actually extract a yellow stain from the green grass.

After failing to find a market for the farmers' home butter because of lack of standard quality, in 1912, eight years after Col. Montgomery's death, Professor Moore asked the college authorities for permission to use part of the dairy building for Mississippi's first cooperative creamery. The creamery was started with 19 patrons, owning 240 cows. During its first year it took in 14,503 pounds of butterfat for which it paid $5,193. Demonstrating its steady growth is the fact that in 1926 it received 645,456 pounds of butterfat for which it paid $301,105.



*The prize-winning float in the parade which was a part of the celebration at the opening of the condensery.*

This healthy growth attracted the Borden Company when it sent out inspectors to spend two years in a careful survey of the South to find a location for the first southern milk condensery. In 1924 an investigation within a radius of 12 miles of Starkville revealed that 7,000 cows were being milked and 6,000 heifers were coming on. Late in the year the company asked for a carload of milk for shipment to an Illinois plant to be processed and examined. The car was ready with 500 gallons in excess at shipping time, this at one milking.

After the milk was tested at the plant, this telegram was sent to Starkville: "Milk received in excellent condition; per cent of acidity, .17; per cent of butter fat, 5.9; if this milk is an average sample of Mississippi milk, Mississippi babies should weigh a ton at 21."

The half million dollar plant of the Southern Borden Company was completed early in 1926. During its first month's operation, in April of that year, it received 1,082,563 pounds of milk from 506 dairies, for which it paid $25,515. During April, 1927, the plant received 3,859,985 pounds of milk from 1,120 dairies for which it paid $108,985. In the same month the college creamery paid its patrons $39,092 for butterfat.

The farmers are paid an average price of about 25 cents per gallon

for whole milk by the condensery. They are paid on the 15th of each month for the milk delivered the previous month. It is interesting to note that the college creamery has continued its healthy growth since the opening of the condensery. It is estimated that there are now 1,500 dairies in the county milking 15,000 cows. The number is steadily increasing.

In 1926 the condensery had a high day of 87,000 pounds of milk. In 1927, its high day has been 158,000 pounds; and in 1928 it expects to go to 225,000 pounds per day. Its present capacity is 160,000 pounds per day. To meet next year's increase the plant will either have to enlarge its equipment or work in double shifts.

Thus dairying is developing a county, but dairying had been given an added impetus in Oktibbeha. Looking backward it seems almost foolhardy to bring the Champion of America Jersey bull and dams from the Isle of Jersey to a section that was afraid of Jersey butter, or among stockmen who looked upon the cattle as small and "cat-hammed." There was also the dread Texas fever to contend with. But Col. Montgomery was a man of courage. It was his nature to be true to his vision.

Today his philosophy is bearing fruit, all Oktibbeha is green with his grasses, and the milk of Oktibbeha cows is in the market-place of the world. His people have found the land flowing with milk and honey.

## Recreation

(*From Page* 4)

and rock-bound coast preferred to fight and starve rather than indulge in reckless betting and unseemly antics when life was so short and money so scarce. They insisted upon the blue laws because sport had been corrupted in their native land.

I looked at a picture of one of my blue law ancestors yesterday and wondered what he would say, or rather just how impossible it would be for him to express himself freely, were I to show him a pink sport sheet wrapped around a sample copy of our yellow journalism. Yet he was something of a noble old Roman, after all, for he took his sport ducking witches at Salem.

This Calvinistic forebear of mine would doubtless frown and fade away at mention of Gene Tunney or Gertrude Ederle, but I wager he would be too good an American not to grudge a sickly grin if I named Slim Lindbergh!

DARING, perfect poise, skill, and speed are ours to admire and derive refreshment from in the realms of sport. We can't all wield the racket or the bat, run bases or steal home, but we can all warm benches, hold tally pencils, and throw pop bottles.

"There's the rub" as the trainer said. We mostly take our sport by proxy and the press. When you and I were kids we played ball regardless of our prestige as experts, only for the love of the game and each other's untamed company.

The encroachment of the commercial age has blotted out the sand lots where we used to play one-old-cat with the alley gang. The juggernaut of commerce has forced many of us to rear a generation that takes its sport in second-hand doses and finds the teams that play on diamonds, courts, and gridirons commercialized, too!

But sport has played its part in human re-creation constructively as well. We can all remember when the only published pictures of the human form divine were in medical magazines, the naked zodiac man in the almanac, and that vividly pink periodical we used to read with sly relish in the barber shops.

We admit they were rather too morbid and foreboding. The zodiac man was partly dissected and completely surrounded by a menagerie that must have been the envy of P. T.

Barnum. This familiar cadaver is still doing duty among us, but nobody notices him any more. The medical magazines were hard to get and hard to read, while the barber's pink sheet aforementioned was available only once in two months or so when our hair got beyond the collar limits.

MODERN sport has re-created our attitude as a nation toward the human anatomy. Knees and thighs are now as common as elbows and knuckle joints used to be. We have found out that fresh air, ultra-violet rays, vitamins, freedom of movement, exercise, and frequent bathing do more to purify the body for a clean soul's habitation than prudishness and half-truths ever did in days bygone.

Your daughters and sisters are growing up unashamed of their legs—unless said legs are unable to carry them through a fierce tennis game or a twenty-mile hike before breakfast.

They have learned to cover them—with the glory of achievement, if little else. Why not? A plain object lesson in health and normality beats a concealed weakness; and this much at least the craze for athletic sport has done for us.

Physical education has supplanted the dunce-cap system of dealing with animal spirits in school. Sports which are organized and intelligently directed are making over the hodge-podge of restraint and misunderstanding. Pedagogues of yesterday either seemed like books of etiquette and memories of lavendar, rose water, pink tea, and old lace; or else terrible catamounts of fury, armed with the birch rod, and daring the big boys to fight or figure, to wrestle or write.

Swings, trapeze, giant strides, merry-go-rounds and horizontal bars are seen in most progressive school grounds. The best thing that sport has done is to relieve the terrible tension of adolescence—and if this isn't vital re-creation, name a better.

How about the man who is neither a sportsman nor a fan? What would you recommend for him in the recreation line?

If he has children maybe he can give them a vacation joy ride, and be refreshed through their enjoyment. But visions of overburdened Dads in picnic-laden flivvers sort of take the kick out of that prescription for me.

Change of work is the best recipe for him, and it usually isn't costly.

Too many railroad men take their resting spells hanging around the train master's shanty in the yards. There are too many clerks who wander back in vacation time to gloat over the fellows on duty. But that isn't the worst of it. The habit of carrying mental business ledgers off on the vacation trip and perhaps indulging in worry over what happens in your absence is the worst fault of modern, high-pressure Americans.

Vacation, of course, comes from the verb, to vacate. It should mean more than vacating the premises where you toil and scheme for yourself or the firm. The man who really gets a restful interlude vacates his job in earnest and leaves the harness hanging up on a peg—which is no more disgraceful and far more constructive than if he had exhausted his energy to the limit and *died* in that old harness!

I KNOW a stately justice of the state supreme court who is a poor idler in vacation spells, but a good hand at proving that a change of work and environment equals indulgence in sports.

He owns a farm and goes out at grain harvest to live and work with the tenant and hired men. He finds himself too tired at night to bother with the contents of his brief case—even if he takes it along, which he doesn't. Incidentally, he has had the same tenant for fifteen years, and although he is a masterful lawyer, there exists no hidebound lease between them.

Doing nothing in vacation time is the hardest mode of recreation, and many of us with no skill in sport or chance to change jobs would find it irksome and conducive to the worry we should always avoid at such times. The best way to accomplish this feat is to attempt something impossible of accomplishment by yourself, and then keep at it, which is after all a sort of compromise between restless energy and recreation.

I have worked this stunt to perfection. I spent two weeks writing the score and libretto of an opera, although I cannot read a note. As it never became audible nobody suffered, and I certainly fulfilled my desire of doing nothing at all without the stagnancy and ennui of idleness.

Select the job you wish you had nerve to tackle in your youth and try this mode of doing nothing. It is relaxing and restoring, providing you do not aspire to be a structural iron worker or drive a racing airplane.

THE other more purposeful way to do nothing in vacation is to ride your favorite hobby. It may be birds, butterflies, postage stamps, ancient ruins, or photography. The more absorbing the better for you, your family, and your job. The man with a sideline hobby is usually least in need of summer recreation, and it is this lasting virtue in hobbies that makes me envy the man who nurses one. Carried too far, however, it may be a pest instead of a pastime.

Sunshine, mental and moral, is what we truly seek most in vacation time if we be sane and reasonable, desirous of tuning up for honest service and all-round health.

Were it only a matter of physical trim, we could get that in a hospital or buy it at the drug store perhaps. Unless we proceed to store up our mental and moral storage batteries with the radiance of inward sanitation during the vacation season, it would seem that the best part of it is lost.

Earthly enjoyment is consistent with fine principles and religion. Pascal, we are told, would not permit himself to be conscious of the relish of food and spices; he wore a girdle armed with iron spikes which he drove into his gaunt ribs as often as he thought himself in need of admonition. He rebuked a mother who kissed and fondled her children, and he assumed an artificial harshness toward his relations for the express purpose of making himself and others miserable. Pascal and the host of other men who have mortified and crucified the flesh in the name of principle lost sight of the connection between a normal life and moral sunshine.

"Mirth is God's medicine," says a wise writer, "everybody ought to bathe in it. Grim care, moroseness, anxiety, all the rust of life, ought to be scored off by the oil of mirth." It is better than emery for grinding out the grooves and rough spots left in a year of constant labor.

A depressed mind prevents the free action of the diaphragm and the expansion of the chest. It stops the secretions of the body, interferes with the free circulation of the blood, and deranges the entire functions of the body. How can you or I ward off mental and physical ailments to better advantage than by setting aside a certain portion of the year for mirth and play?

Then, when the first vitalizing physical flush of vigor derived in the outdoors is worn away upon our return to duty, we have the memories, the trinkets, and the photos gathered in that resting spell to give us the mental stimulus that we shall require before another July comes around again.

New acquaintances are made, new adjustments secured, broader conceptions realized. Good vacations aid content and spur ambition. They are worth the time and effort. Might as well forget the nominal cost of one, for you'll pay for it whether you take it or not.

Cashing out beats cashing in!

## WHAT'S IN A NAME?

A woman who was living in a hotel in San Francisco hired a Chinese boy.

She said: "What's your name?"

"Fu You Tsin Mei," said he.

"Your name is too long. "I'll call you John."

"What's your name, please?" said he.

"Mrs. Elmer Edward MacDonald."

"Your name too long. I call you Charlie."—*Wall Street Journal.*

## THE RIGHT SPIRIT

An old farmer made a trip to the city and decided to startle the wife by appearing in brand new raiment. To save wear on the new suit he placed it in the back of the wagon. A few miles from home he took off his old clothes and tossed them off a bridge into the river.

He was surprised to see that the new clothes had dropped out of the wagon.

"Giddap, Maude," yelled the old man, pulling down his shirttail as he realized his plight. "We'll surprise her anyhow!"—*Rice Owl.*

## NO GATE TENDER

An engineer, surveying the right of way for the proposed railroad, was talking to a farmer.

"Yes," he said, "the line will run right through your barnyard."

"Well," answered the farmer, "ye can do it, if ye want, but I'll be jiggered if I'll git up in the night just to open the gate every time a train comes through."

## A NAUGHTY CAT

"Look here," exclaimed little Jean, stamping her foot, when she saw Tabby carrying a little kitten by the back of its neck. "You ain't fit to be a mother cat! No, you ain't even fit to be a father."—O. P., Wisconsin.

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Hubby — I miss the old cuspidor since it's gone.

Wifey—You missed it before — that's why it's gone.—*Pathfinder.*

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Women who refuse to have birthdays ought to give them to small boys, who can enjoy them.

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"Chickens, suh," said the old Negro sage, "is the usefulest animal dere is. You can eat dem before dey is born and after dey is dade."

## 'RAY FOR ST. PATRICK

A homesick Irishman had got a job as crossing guard for a railroad. The foreman handed him a red flag and a green flag, and told him, "Whenever you see a train coming, get out and wave this red flag."

"Git away wid ye job!" exclaimed Pat; "Me wave a red flag when Oi got a grane one handy. I'll starve first."

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Professor (after hour's dissertation on Egyptian archeology)—"Does anyone care to ask any questions?"

Voice in back of room—"Just one question, professor. In your opinion, what is clam digging—fishing or agriculture?"

# Winter Wheat

WHEAT needs fertile, well-prepared, and well-drained soil to carry it through winter.

Liberal application of high analysis, well-balanced fertilizer, containing ample potash, will help prevent winter injury, increase yields and test weights, improve quality and grade, and produce a healthy plant and firm full grain.

Potash produces plump, sound grain, and stiff straw that does not lodge. When potash is lacking, the grains ripen too early and lack quality; the stems and leaves die while the grain is still immature. Potash is cheap. Use it liberally.

*Send us your name and address and we will mail you your copies of: "Better Grains and Hays" and "Fertilizing Wheat and Clover".*

Agricultural and Scientific Bureau

N. V. POTASH EXPORT MY. *of Amsterdam, Holland*

NEW YORK OFFICES: 19 West 44th Street

NEW YORK
BALTIMORE

ATLANTA
JACKSON

CHICAGO
SAN JOSE

# $2.25 per acre would have made this healthy cotton

THIS cotton is suffering from rust. The plants are small and unhealthy, with but few bolls. They were practically defoliated by the middle of August. Cotton rust is potash hunger.

Liberal fertilization prevents the above condition. However, phosphoric acid and nitrogen alone will not prevent rust. $2.25 worth of potash per acre, added to the other elements would have made this cotton healthy without a trace of rust.

Farmers who grow cotton like that shown above save a potash investment of $2.25 per acre, but they lose from 10% to 50% of their cotton crop.

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